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AIR FORCE GRADUATE AND UNDERGRADUATE EDUCATIONAL PROGRAMS: NEED, STRUCTURE AND FOCUS

A Research Paper

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by

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Disclaimer

The views expressed in this academic research paper are those of the authors and do not reflect the official policy or position of the U.S. Government or the Department of Defense.

Preface

This study is based on an examination of the role of education for the military professional. It was conducted in response to an Air Education and Training Command (AETC) Commander request for the Air University (AU) Commander to lead a review of the structure and focus of undergraduate and graduate education programs. AETC/ED assembled the key players and charged them to develop a research thesis. Nine Air Command and Staff College (ACSC) students and faculty members conducted the study. This research project investigated the existing structure of off-duty, voluntary graduate and undergraduate education opportunities that meet Air Force needs in both the officer and enlisted corps. It examined the broad facets of off-duty, voluntary education to include value to the Air Force and individual, cost versus return on investment, and impact on career progression. The research also explored the influence of education opportunities on quality of life and morale of Air Force and corporate individuals. Specific focus was placed on understanding the importance of the Tuition Assistance (TA) program with respect to recruitment, retention, and individual motivation.

The study effort also included four extensive briefings to key decision makers. On 3 February 1995, AU/CC was briefed on the basic outline of the project to include the survey instrument. On 27 March 1995, AETC/CC was briefed on the scope, outline and status. In addition, the Air University Board of Visitors was briefed on the study and preliminary results. Finally, on 21 April 1995, AU/CV and representatives from the Air Staff and Headquarters AETC were briefed the results of the project (see Appendix A).

Considerable feedback was provided during these briefings and incorporated into the study process.

The research team would like to thank Dr Glen Spivey, ACSC/CAE, and Ms Cheryl Monday, AU/XOPP, for all their assistance and support throughout the course of this successful project.

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Abstract

This study was based on an examination of the role of education for the military professional. It investigated the existing structure of off-duty, voluntary graduate and undergraduate education opportunities that meet Air Force needs in both the officer and enlisted corps. It also examined the broad facets of off-duty, voluntary education program to include value to the Air Force and individual, cost versus return on investment, and the impact on career progression. The research further explored the influence of education opportunities on quality of life and morale of Air Force and corporate individuals. Specific focus was placed on understanding the importance of the TA program with respect to recruitment, retention, and job performance and job satisfaction. The projects' methodology included a content analysis of the Air Force's officer job advertisement database and a comprehensive TA and education survey. Results of these analysis tools revealed widespread benefits of education to the individual and the Air Force. The conclusions and recommendations call for continued Air Force support for graduate and undergraduate opportunities. The study was conducted in response to an AETC Commander request for the AU Commander to lead a review of the structure and focus of undergraduate and graduate education programs. AETC/ED assembled a working group and charged them to develop the research thesis. Nine ACSC students and faculty members conducted the study which incorporated feedback garnered during extensive briefings to the Air University Board of Visitors, representatives from Headquarters United States Air Force Air Staff, AU/CC and AETC/CC.

AIR FORCE GRADUATE AND UNDERGRADUATE EDUCATIONAL PROGRAMS: NEED, STRUCTURE AND FOCUS

CHAPTER 1

Background and Statement of the Problem

Background

> In an environment of flexibility and change, it is clearly impossible to hire people who already know everything they're ever going to need to know, so continuing education over the lifetime of a job becomes the norm in a reengineered company.[1]

Although Hammer and Champy were referring to business and industry, their statement has application to the Air Force. The Air Force has been and is continuing to be *reengineered* to meet the challenges of the future with a smaller force. The role of education and training in the reengineered Air Force was highlighted by the Chief of Staff of the Air Force (CSAF) when he declared 1992 as the *Year of Training*.

Concern about education for the military professional is not a new phenomenon, but is receiving renewed emphasis as the military forces downsize. Over 120 studies and assessments were conducted of Air Force professional military education from 1946 to 1987.[2] Many other studies such as the Clements Committee[3] have been conducted of the total system of education for military professionals and off duty educational pursuits. Other studies, such as the General Accounting Office (GAO)[4] study conducted in 1970 and the National Academy of Public Administration Panel,[5] have focused on graduate education for military officers. This study focuses more narrowly on off-duty voluntary

education for military personnel. Chapter 2 describes data from studies relevant to this project.

Statement of the Problem

In FY93, the USAF TA program spent $49.6 million and was expected to spend $51 million in FY94.[6] Continued increases are expected due to an uncertain future and a national higher education inflation rate of 8 to 14 percent per year.[7] This trend prompted the AETC Commander to evaluate the need, structure and focus of the Air Force graduate and undergraduate programs. Specifically he wanted to ensure tuition assistance eligibility contained rigor, happened at the right time and place in a member's career, and was complementary to *Year of Training* initiatives. The AETC Commander tasked the AU Commander to conduct a review of the structure and focus of undergraduate and graduate education programs.[8]

The AU Commander assembled a working group comprised of representatives from Headquarters USAF, Headquarters AETC, and AU and charged them to develop a research thesis. The thesis developed was:

> To build the world's most respected air and space force the Air Force must assure off-duty, voluntary graduate and undergraduate education opportunities are structured and sequenced to meet Air Force needs in both the officer and enlisted corps.[9]

The task presented to the research team was to investigate how to best assure off-duty, voluntary graduate and undergraduate education opportunities are structured and sequenced to meet Air Force needs in both the officer and enlisted corps. The team was challenged to examine the broad facets of the off-duty, voluntary education program to include value to Air Force and individual, cost versus return on investment, and

relationship to the individual's career progression. The research team also investigated the influence of education opportunities on quality of life and morale of Air Force people.

Significance of the Study

The rationale for this study is based on the recognized importance of education and training for a ready military force. The success or failure in future conflicts may depend as much on intellectual superiority as on numerical and technological superiority.[10] Results of the study should afford Air Force decision makers valuable information for establishing a comprehensive educational philosophy and prioritizing resources to support educational efforts.

Scope and Limitations of the Study

The primary focus of this study was the off-duty voluntary educational opportunities provided by the Air Force as a vehicle for self-development and recruiting/retention incentives. Although the primary focus was off-duty voluntary education, support for these opportunities should be consistent with the overall Air Force educational program. Any study of a component of the Air Force education program should be done in the context of the comprehensiveness of the total program. The findings of the study are generalizable only to the Air Force, however, findings may provide valuable insight for the other services.

The study deals with Department of Defense (DoD) and Coast Guard education programs. The study did not deal with programs administered through Veteran's Affairs such as the Montgomery GI Bill, Veteran Education Assistance Program (VEAP) and the

Education Assistance Test Program (EATP). The study also did not address the Bootstrap program.

The content analysis methodology used has several limitations. The most obvious limitation is that job descriptions written in the Daedalus job advertisements were not standardized. They were written by a variety of manpower specialists and often reflected a moderate degree of individuality and, consequently, variability. Many advertisements were written in a form of shorthand, using nonstandard abbreviations and laden with career field specific Air Force acronyms. In order to maintain a measure of scientific objectivity, job advertisements were scored based on the words used in the description as they related to those anticipated in the codebook. Even so, the researchers did note similar job titles which varied substantially in job description. Most notable were those advertisements with little written about the job content; or worse yet, containing only a discussion of its favorable geographical location or the promise of a follow-on assignment. Another important limitation of the content analysis stems from the nonstandardized way in which positions were advertised. For instance, it was impossible to determine if specific jobs were being advertised to job seekers in various career fields. In addition, some job advertisements stated the number of open positions, while for others it was only implied.

The limitations of the Air Force TA and Off-Duty Education survey are inherent to any survey instrument. Although the researchers endeavored to insure as complete and comprehensive study as possible, factors such as sample similarity (or dissimilarity) to the Air Force population, personal interpretation of survey questions, and respondent errors in data entry did occur. The PME student subjects of the survey closely approximated the Air Force population with several exceptions, including the absence of junior enlisted in

the grades E-1 to E-4, junior officers in the grades O-1 and O-2, Chief Master Sergeants, and field grade officers not selected to attend PME in residence. A separate study with an identical survey instrument, but distribution to a random sample of all CONUS-based USAF personnel, is being conducted in the May-July 1995 timeframe.

Several survey questions contained wording, such as the phrase "major factor", that required respondents to interpret their personal definition of "major" prior to recording an answer. This is a flaw found and attempted to be minimized in all survey collection instruments. Finally, some subjects filled out sections of the survey incorrectly. Researchers took great pains to confirm or refute anomalous data, like "commissioned" enlisted personnel; but in the end, some assumptions had to be made to prevent losing meaningful data. These assumptions were minimized.

Assumptions

Certain assumptions were necessary as data were gathered and analyzed. The research group assumed that officer and enlisted education are equally important and that all officers should have at least a bachelors degree. These assumptions are consistent with the current Air Force philosophy.

For purposes of this study, it was assumed that each job advertisement represented a single position unless a specific statement in the ad gave a specific number of job openings. However, given these limitations, some interesting findings can be found in the content analysis.

The $11 million shortfall[11] in TA is just one indication of constrained resources. The bottom line is there will not enough money to cover all educational requirements.

CHAPTER 2

Review of Research and Related Literature

The vast number of studies, reports, regulations, manuals, and debates concerning education and training for the military professional made it necessary to resort to purposeful selection of literature to be reviewed in this study. The review was limited to selections to orient the reader to the intrinsic values of education to the individual, extrinsic values to society and the Air Force, the education paradigms for the Air Force and industry, and descriptions of education status and utilization of off-duty educational opportunities by other services. There exist several distinct problems when one explores the existing literature on the outcomes of education on the individual and society and then tries to relate them to the military educational system. First, the vast majority of studies performed tend to be limited to correlation studies in which the attainment of higher education is linked to individual and societal outcomes. Furthermore, this scarcity of scholarly study into the identification and exploration of causal inferences make it more difficult to come to meaningful conclusions as to the value of education.

As the research team began the review of literature it became clear that the terms *education* and *training* were used inconsistently. The terms have been debated and discussed in the Air Force but are often used interchangeably in industry. The first section of this chapter is presented to clarify the use of those terms.

Education Versus Training

The study was focused on education. Training and education are essential elements in developing and maintaining a high-quality military force and enhancing readiness. The differences between education and training are often debated in military circles as well as public education. Johnson[12] sees the differences only in purpose. Education is learning for use in unpredictable situation, while training is learning to use in predictable situations. Many conclude that education and training are two sides of the same coin. The Air Force has separate policy directives for education and training. Air Force Policy Directive (AFPD) 36-22 governs training and defines military training programs as those "formal and informal courses or other methods of instruction that provide military personnel with knowledge and skills required to perform duty position and additional duty tasks."[13] AFPD 36-23 governs military education and states that education programs expand knowledge and increase one's understanding of the role of aerospace power in war and prepare individuals to assume higher levels of responsibilities. Military education is defined as "the systematic instruction of individuals in subjects which will enhance their knowledge of the science and art of war."[14] Education should prepare students to "(1) identify and define problems in a complex and uncertain environment, (2) comprehend a range of alternative solutions, and (3) develop analytical skills required for reaching sound solutions."[15]

Intrinsic Values of Education to the Individual

Significant increases in both verbal and quantitative skills are associated with students who have completed college. In a 1970 study, Spaeth and Greeley[16] surveyed a large

sample of college alumni. Of this group, 41 percent stated that college had developed their verbal communication abilities "greatly" while another 46 percent stated that it developed their abilities "somewhat." In a similar study, Pace[17] reports that 63 percent of college alumni stated they had benefited "very much" or "quite a bit" in terms of an ability to write and speak clearly and effectively. These results fare well with the intuitive belief that time spent writing, speaking, arguing and conversing in an academic environment improves one's communicative abilities. A study by Roth[18] suggests that higher educated workers tend to write longer, more in-depth reports, and spend additional time revising their work than their lower-educated counterparts. In addition, a general finding was that the higher the education level the employee possessed, the more important writing was perceived to be by him or her. In a related study, Jenkins[19] suggests that on the average, business groups are satisfied with the oral and written skills of their MBA employees, although they felt that further advances were needed in this area of communication skills.

The evidence presented in the literature strongly supports the idea that on the average, students make considerable gains in substantive knowledge during their stay in college. Bowen[20] reports on several studies, Learned and Wood, Lannholm and Pitcher, Lenning, Koon and Pace, and explains how using a variety of methodologies, these researchers clearly establish a strong link between undergraduate college work and the acquisition of substantive knowledge—across the spectrum of disciplines; literature, fine arts, history, social sciences and general sciences.

Another important outcome of higher education is rationality. Bowen[21] defines rationality as "the ability and disposition to think logically on the basis of useful assumptions; see facts and events objectively—distinguishing the normative, ideological

and emotive from the positive and factual; weigh evidence and evaluate facts and ideas critically; think independently; analyze and synthesize." Another common term associated with rationality is "critical thinking." The literature is inconclusive as to the effect college has on rationality. Bowen[22] describes a series of longitudinal studies conducted by Feldman and Newcomb which used the standardized Omnibus Personality Inventory. This Inventory took a look at two dimensions associated with rationality: theoretical orientation and thinking introversion. Theoretical orientation merely attempts to measure one's interest in "scientific, logical and critical thinking." Thinking introversion measures students' interest in "academic activities, abstract reflective thought, and a broad range of ideas expressed in literature." The majority of these studies suggested that statistically significant gains in rationality occur during college. An important study conducted in 1969 by Trent and Medsker[23] is of particular interest. Their longitudinal study was successful in comparing a college group to their non-college counterparts. This extensive study (10,755 graduates of high schools in the midwest and California) generally found that those who attended college made greater gains in thinking introversion than their counterparts who were either employed or working in the home.

Intellectual tolerance is an important goal of higher education. Bowen[24] defines intellectual tolerance as "freedom of the mind." He goes on to suggest that it includes qualities such as "openness to new ideas, willingness to question orthodoxy, intellectual curiosity, ability to deal with complexity and ambiguity, appreciation of intellectual and cultural diversity, historical perspective," among others. The first two attributes are of particular interest to the USAF as it pursues the concepts and practices of W. Edwards Deming and the Total Quality movement. In a similar vein, the idea of an appreciation for

cultural diversity has become a hallmark of human relations in the military. Personnel are exposed to the positive aspects of cultural diversity in a workplace setting.

Many of the studies in the area of intellectual tolerance use a series of tests as a measurement device. One, the Complexity Scale, measures intellectual adventurousness. Those who are able to tolerate uncertainties and ambiguities tend to score high on this scale. A second measure, the Autonomy Scale, seeks to identify those who posses a need for independence and are nonauthoritarian thinkers—intellectually liberal. A third measurement device, the Social Maturity Scale, measures nonauthoritarianism and one's flexibility in thinking. Using these tools, Trent and Medsker[25] identified significant gains in terms of complexity, autonomy, and social maturity over the course of four years in college. Perhaps more importantly, they discovered a large difference in gains between those who attended college and those who had not.

Taylor[26] presents findings along these same lines. He suggests that officers who possess graduate degrees tend to be less absolutist and therefore are "less likely to be victims of single factor analysis of political issues" than their non-graduate degreed contemporaries. In addition, these degreed officers tend to display a greater variety of political views than their contemporaries.

Some scholars suggest that the true value of higher education lies not in the myriad of facts, formulae, and details one learns in college, but in the broad residual knowledge that lingers long after the vast majority of college courses are forgotten. In an interesting look at this phenomenon, Hyman[27] compared the percentage of middle-aged people who correctly answered questions in public opinion polls based on general information and knowledge. Their findings show a strong positive correlation between the level of

education attained and the number of questions answered correctly in public opinion polls. Perhaps even more significant is Bowen's[28] encapsulation of the large amount of evidence that indicate additional residual outcomes. College alumni tend to buy, own and read a greater number of books than their high school graduate contemporaries. In addition, college graduates tend to read more news-based periodicals. Finally, college graduates tend to watch less television and when watching television, viewed a greater proportion of news, educational or documentary programming than their non-college educated contemporaries.

An affective outcome of higher education, psychological well-being, will now be discussed. Bowen[29] summarizes the literature as being inconclusive as to whether college contributes to or harms one's mental health. By choosing various measures of mental health or psychological well-being, one can emerge with conflicting results. However, one in-depth survey of nearly 2,500 adults by Gurin[30] et al, concluded that education had the following impact:

> The more highly educated respondents seem to be more aware of both the positive and negative aspects of their lives. They are happier—in their overall evaluation of their current happiness, in their marriages, and in their jobs—and are more optimistic about the future than the less educated respondents. These findings were still present even when controlled for income level.[31]

In terms of the individual, the link between educational attainment and job promotion prospects seems to have a certain amount of validity. Using samples from a spectrum of salary grades, Spilerman and Lunde[32] studied the effects of community college, undergraduate and graduate degrees and their effects on job promotion. The study group (employees of a large insurance company) was segregated into categories

based on pay grade. They found that a master's degree increased one's chances for promotion, independent of employment duration. This held for master's degrees the researchers categorized as bringing skills that could enhance work performance. This suggests that there was an absence of "credentialism" or the signaling of advanced promotion prospects without the requisite job performance.

One of the most significant affective outcomes of higher education is the contribution it makes in helping students "find themselves." Bowen[33] calls this understanding of lifetime aspirations "personal self-discovery." Understanding one's unique talents or interests can be a primary motivator for college attendance. This might explain why so many military recruits state that the potential for increased education is a primary reason for serving in the military.

Extrinsic Values of Education to Society and the Air Force

> If my analysis is roughly correct, the focus for change facing the world could be so far-reaching, complex, and interactive that they call for nothing less than the reeducation of humankind.[34]

Now the literature survey will turn to external educational outcomes. Although these might be interpreted as having benefit to the individual, they are considered in this section as possessing external benefits to society as a whole—thus perhaps making them desirable in terms of public policy preferences.

While speaking of graduate education for military officers, Taylor[35] suggests that officer graduate education must rest on three pillars: the technical component of education, which helps the officer keep abreast of advances in management and technology; the critical component, which helps the officer develop his or her abilities to

use judgment on "difficult questions of priorities and trade-offs among resources and values;" and the assessment of values and attitudes that the nation would like to be held by its officers.

One societal outcome of higher education is a positive correlation to voting behavior. The U.S. Department of Education's National Center for Education Statistics[36] reports that in 1990, college graduates (aged 25 to 44) were 67 percent more likely to vote than high school graduates. While over time there has been a general decline in voting in Presidential elections, declines were smaller among the higher educated groups. This finding has been supported in the past by those studying voting behavior versus educational attainment level as far back as 1944.

The link between educational attainment level and income level has been well established. This link would seem to have little impact on the military professional. However, during the contemporary environment of drawdowns and reduction-in-forces, a degree to ease a possible early transition to civilian life might be desirable both in terms of the individual and society. Edwin Dorn, Undersecretary of Defense for Personnel and Readiness,[37] addressed this point in the keynote speech "Strategies for Military Education" to the DoD Worldwide Education Symposium in March, 1994. He stated "an important part of personnel support is transition support, and some of our educational and testing programs are geared toward helping separating service members through their transition out of service...Service members are concerned about the downsizing, and that is in part why they are enrolling in off-duty educational programs in record numbers." Brown[38] reports that the former Chairman of the Joint Chiefs of Staff, Colin Powell, wrote in a 1990 letter to military services,

> I strongly advise you to take advantage of the voluntary education program to catch up with your education before you leave the military. The military services need well-trained, educated people. Your pursuit of higher education will not only enhance your military job performance and chance for promotion, but will also improve your job opportunities when you return to civilian life.

The thrust is this: senior leaders feel higher education helps enhance military job performance. In addition, a separating military member can increase his or her chances for a successful transition to civilian life by participating in off-duty education programs. Therefore, society benefits by a better allocation of skilled labor.

Best and Eberhard[39] advance the notion that due to "a future that is more volatile, competitive, and complex than ever before," adults must continually participate in educational endeavors in order to keep pace with the changes. Taylor[40] supports this idea of lifelong learning. In his prescription for officer graduate education, he suggests that a technical component of officer education is a critical "pillar" which is needed to help the officer corps refine their technical and management skills in light of current theories and practices. Society benefits from this force of highly educated officers by their contributions once they enter the civilian labor force.

In terms of potential benefit of higher education to the USAF, two studies conducted by the Community College of the Air Force (CCAF) present some interesting data.

The first study made use of the ATLAS database. Some of the more significant findings suggest a positive correlation between participation and earning a CCAF degree, and upgrading to the craftsman level earlier, as well as earlier promotion to staff sergeant than those who do not participate in the CCAF program. Lt Monson[41] states "graduates are likely to reach the craftsman level significantly earlier than personnel who are working

towards a degree and personnel who are pursuing a degree will reach the craftsman level significantly earlier than nonparticipants in CCAF programs." The second study, "CCAF Status and Reenlistment Eligibility"[42] focused on the relationship between attaining CCAF graduation and being eligible to reenlist. Those unfit to reenlist includes "but is not limited to, those who are serving punishments imposed by courts-martial, those who are absent without leave or have deserted, those who are in Phase I of the Weight Management Program, those in Tracks 4 or 5 of the Substance Abuse Rehabilitation and Treatment Program, those who have been notified they will be involuntarily separated, those who are conscientious objectors, those who have been convicted by civil authorities, those serving punishments imposed under Article 15 of the Uniform Code of Military Justice, those who are on the Control Roster, etc." Some of the findings of this study suggest that the percentage of members who are in "good standing" to reenlist is greater among CCAF graduates than among non-CCAF graduates. This relationship also held for college degree holders at the associate's level or higher. These findings suggest that there is a link between one's educational attainment and being able to reenlist in the Air Force.

Education and Training Paradigms for the Air Force

Basic Aerospace Doctrine indicates "success in war depends at least as much on intellectual superiority as it does on numerical and technological superiority."[43] The Air Force paradigm stresses a balance among technical or functional training, education (professional military education and general education), operational experience, and personal effort. Air Force doctrine emphasizes these elements are complimentary. The individual's personal effort, over his or her career, ties all these elements together.[44] This

factor should be kept in mind as one reviews this study because of its primary focus on off-duty voluntary education.

Professional Military Education. The review of literature related to *professional military education* was limited to providing contextual setting for the total education of the military professional and possible relationship to degree requirements the research group might consider. Since 1946 numerous studies on various aspects of Air Force Professional Military Education (PME) have been conducted. Bangs[45] indicates that over 200 individual studies have been conducted of PME. Davis[46] reports various study groups have made over 120 distinct assessments of Air Force PME. These studies looked at many different facets of PME but topics that seemed to receive most attention were structure, eligibility requirements, timing of attendance, and target audience. Shortly after World War II the War Department [47] established some initial guidelines and framework for the development of a professional military education system for commissioned officers. This study is considered the cornerstone on which the Air Force officer PME system was built. Later a PME system was also established for enlisted personnel. These original ideas have proven sound and remained essentially intact. Various aspects of the system have been altered somewhat, but consensus remains that there is value in PME. Opinions on the significance of PME vary, but all seem to acknowledge its importance. The PME vision statement developed by the Panel on Joint Professional Military Education CJCS states that the PME system of the 21st century "will consist of Service-specific and joint education that is essentially seamless, offering educational opportunities at all stages of the military officer's career."[48]

The initial general goals for Air Force education were to provide officers technical training to do their jobs, educate officers in the broad context of national security issues, and encourage forward thinking.[49] From its inception, the Air Force has stressed education of airmen as a continuous process. A military board chaired by Major General Muir S. Fairchild stressed the long range goal of enhancing education in the Air Force.

> The average officer at the end of World War II had about one year of college. The Air Force wanted to elevate this standing to at least the baccalaureate level. Hence, a major focus of the Fairchild board was to enhance degree-granting opportunities, including the expansion of Air Institute of Technology programs and the possible accreditation of Air War College (AWC) and/or Air Command and Staff College (ACSC).[50]

Degree granting and accreditation have reemerged as issues in the professional military education community. The National Defense University, Naval War College, Air Force School of Advanced Airpower Studies (SAAS), and Army Command and General Staff College now have authority to grant degrees at their PME institutions. The Marine Corps University is currently seeking degree-granting authority. Other Federal degree-granting authority exists at other Air Force and DoD agencies, i.e., Air Force Institute of Technology, Community College of the Air Force, Defense Language Institute, etc. This trend should be factored in when looking at education requirements for military professionals.

Personal Effort.

> Every airman, of whatever rank, should be personally committed to making maximum use of training, and experience opportunities. Each individual must take the initiative to learn and understand as much as possible about the complexities of warfare. Such personal effort is the mark of the professional and is the key to the success of any Air Force professional development.[51]

Professor I.B. Holley sums up individual responsibility: Though formal professional education is useful, it can never substitute for a lifetime of self-directed, self-imposed, self-conducted, self education.[52]

The Air Force provides a number of programs to support individual efforts. Air Force policy supports this personal effort by providing voluntary educational opportunities. AFPD 36-23 indicates these voluntary educational opportunities are designed to compliment professional development and provide a vehicle for self-development.[53]

The Career Progression/Promotion and Education Relationship. This section of the study summarizes the education level of Air Force personnel. It also describes the consequences of advanced education on promotions to major, lieutenant colonel and colonel for officers with a "promote" recommendation. It includes a review of the TA issue and encompasses a summary of influencing factors and relevant research. Table 1 depicts the enlisted work force by education level as of 30 September 1994.

Table 1. USAF Enlisted Education Level Versus Rank

Ed Lv	HS or Less	Hs+	AA	Bach	Bach+	Mas	M+	Prof
AB	10961	442	15	2	0	1	0	0
Amn	14583	3955	8	4	0	0	0	0
A1C	23800	21071	930	1069	9	19	2	0
Sgt	17270	66183	3818	1567	22	35	3	22
SSgt	4961	63501	10220	2549	50	194	4	37
TSgt	1542	33188	10031	2315	71	298	7	34
MSgt	485	20004	11158	3462	155	622	3	10
SMS	2	2211	2966	1240	69	321	0	1
CMS	3	963	1413	713	45	240	1	2

The USAF enlisted corps is particularly well educated. As of September 1994, virtually 100 percent (340,751 out of 340,777) enlisted personnel possessed at least a high

school education. Seventy-eight percent (267,170) of enlisted personnel have completed some college courses. The number of personnel with associate, baccalaureate (or baccalaureates plus), and master's (or master's plus) are 40,599, 13,342 and 1751 respectively.[54]

Table 2. USAF Officer Education Level Versus Rank

Ed Lv	RN	Bach	Bach+	Mas	Mas+	Doc	Prof
2Lt	0	6728	177	160	1	1	8
1Lt	0	6433	529	545	10	6	69
Capt	2	16817	3370	11339	210	194`	2745
Maj	11	1804	942	10473	155	310	2359
LtC	2	414	299	8382	96	360	1435
Col	0	85	52	3087	26	154	918
BG	0	5	0	152	1	4	11
MG	0	10	2	58	0	2	6
LtG	0	3	0	29	0	0	1
Gen	0	0	0	11	0	0	0

Table 2 provides Air Force officer education level statistics by grade as of 30 September 1994. The chart does not include the 7,567 officers with professional degrees.[55]

As you can see, nearly 60 percent of the officers have completed some post baccalaureate education. Forty-nine percent, or 35,766 officers have obtained at least a master's degree. For officers of the grade captain or greater, 35,043 or 57 percent have competed at least a master's degree.[56]

Clearly, the education level of the officer corps increases with rank. Subsequent charts reveal the relationship between an Advanced Academic Degree (AAD) and promotions for officers with a "Promote" recommendation on recent officer promotion boards.

AAD And Promotion To Field Grade Ranks. Based on the results of the last four captain to major promotion boards, an officer with a "Promote" recommendation without a master's degree can still be selected for major. However captains with "Promote" recommendations, officers with an AAD had significantly higher promotion rates than officers with just a baccalaureate degree.[57]

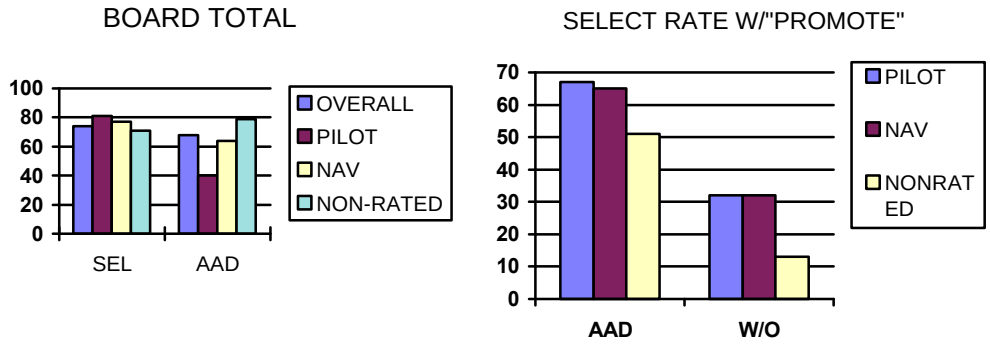

Figure 1. Majors Promotion Board Summary

As shown Figure 1, the promotion selection percentage for all officers is over 74 percent. Sixty-eight percent of selected officers had an AAD. For officers with a "Promote" recommendation, rated officers with an AAD had twice the promotion rate of rated officers without an AAD (from 32 percent to 65 and 67 percent for navigators and pilots respectively). For non-rated officers, those with an AAD were promoted at four times the rate of officers without an AAD (from 13 percent to 51 percent) for non-rated officers.[58]

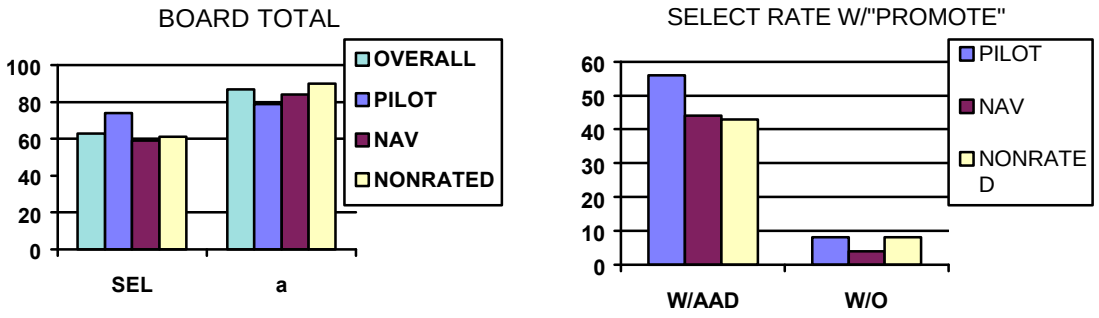

Figure 2. Lieutenant Colonels Promotion Board Summary

Figure 2 shows the correlation between AAD and promotion, for officers with a "Promote" recommendation to lieutenant colonel. Based on the results of the last three major-to-lieutenant colonel boards, 63 percent of all officers considered were selected for lieutenant colonel. During that same period, 87 percent of the selected officers possessed an AAD. For majors without a "Definitely Promote" (DP) but with an AAD, the selection rates were a reasonable 56 percent, 44 percent and 43 percent for pilots, navigators and non-rated officers. For officers with neither an AAD nor a DP the results were significantly less attractive. Their promotion rates were 8 percent for pilots and non rated officers and 4 percent for navigators.[59]

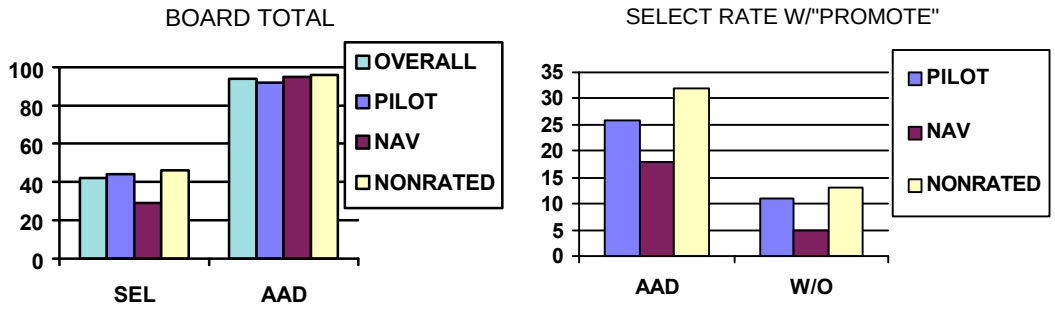

Figure 3. Colonels Promotion Board Summary

As to colonel, the promotion opportunity for officers without a DP fell from the rates for promotion to lieutenant colonel. The rates for officers without a DP or an AAD were quite small indeed. Forty-two percent of the officers considered for promotion to colonel over the last three promotion boards were selected. Ninety-four percent of those colonel selects had an AAD. For officers with an AAD and a "Promote" recommendation, the selection rate to colonel was 26 percent, 18 percent and 32 percent for pilots, navigators and non-rated officers. Officers with neither a DP nor an AAD had a selection rate of 11 percent, 5 percent and 13 percent for pilots, navigators and non-rated officers.[60]

Basic Military Training (BMT) Survey. The BMT Survey Program, administered by the Air Force Recruiting Service, was established in 1976. Its purpose is to determine the impact of recruiting and advertising programs and to establish a data base for evaluation purposes. In 1986, the program was divided into separate surveys for advertising and recruiting evaluation. Typically, 40 percent of the questions on the two surveys are identical. Samples of USAF enlisted basic training students take the survey on their 28th training day. In 1993, 1,505 basic trainees completed the "advertising" survey and 1,650 were administered the "recruiting" survey.[61]

The FY93 BMT Military Training Survey Report summarized the common question of the two surveys. Ninety-six percent of the respondents intended to complete an advanced degree (6 percent associate, 41 percent bachelor's and 50 percent advanced or professional degree). Over three quarters of the participants would have attended full time college or vocational school if they had not joined the Air Force.[62]

Job security, public service, job experience and training and the opportunity to travel were noted as reasons the participants joined the military. "To continue education"

however, was by far the most popular reason for joining the Air Force with over 70 percent of the respondents listing education as an influence in their enlistment decision.[63]

Tuition Assistance. Tuition Assistance varies with respect to many factors according to an extensive Defense Manpower Data Center (DMDC) conducted in 1988 by Boesel and Johnson. Boesel and Kyle found a positive correlation between TA usage and retention and promotion for enlisted personnel. They also found a positive correlation between TA usage and retention for officers. They determined that 30 percent of service members pursue some type of voluntary education during their careers and 50 percent of them use TA.[64]

Rank, age, race, marital status, Air Force Officer Qualifying Test Scores, education level and course availability impact on TA usage. Their study found women, minorities, and younger personnel significantly more likely to use TA. They also found the higher a person placed on the Air Force Officer Qualifying Test, the more likely he/she was to use TA. Personnel with 1 to 4 years of college were the most likely to use TA. Numerous environmental influences acted on TA use during the past decade. Tuition Assistance policy changes, military drawdowns, inflation and economic pressures all had their impact.

There were several significant TA policy changes in the late 1980s. The policy of paying 90 percent of tuition costs for noncommissioned officers with 9 to 15 years on service was ended. The 75 percent reimbursement of TA was capped at $250 maximum per credit hour cost. During the same year, military members were compelled to use their GI Bill benefits before using TA. This policy was rescinded after 2 years. A limit was also placed on the total number of credit hours TA would fund. This limit was equivalent to a maximum of two courses in an 8 week term. Finally, it was deemed that TA would

not fund a second bachelor, master's or doctorate degree. The use of three types of GI bills also complicates gaining a clear understanding of the factors influencing TA.[65]

Major Command (MAJCOM) Initiatives. In addition to TA, two MAJCOM initiatives exist that provide off-duty voluntary education to Air Force members. One such program is Air Force Space Command's (AFSPC) Missile Crew Member Education Program (MCMEP). MCMEP funds 100 percent for tuition and books for off-duty graduate education for combat-ready missile combat crew members (MCCMs) at each intercontinental ballistic missile wing and missile group.[66] The objective of the program is to attract volunteers to the missile combat crew force by offering them the opportunity for graduate education at no cost.[67] The program is designed to accomplish two objectives. First, is to raise officers' educational level by providing them the opportunity to obtain a graduate degree and secondly, to improve career development of the individual officer.

To qualify for the program, individuals must possess a baccalaureate degree and meet program specific admission standards. Missile crew members may elect to participate in locally available, regionally accredited graduate programs, e.g. MCCMs stationed at the 321st Missile Group, Grand Forks AFB, North Dakota may attend Central Michigan University, Embry-Riddle Aeronautical University, the University of North Dakota or Minot State College.[68] Additionally, the officers can earn master's degrees in Space Studies, Business Administration, and Aeronautical Science, to just name a few.[69] The one caveat to the program is MCMEP funds are not authorized for courses or programs at the same or lower level of a degree already attained.[70]

For individuals enrolled in the program class attendance is scheduled, to the maximum extent possible, as an authorized and integral part of missile crew duty.[71] However,

individuals in this program are not removed from missile crew duty and keep the same workload as those individuals who have completed or who are not pursuing an advanced degree.

Table 3 outlines the cost of MCMEP and the number of degrees students attained for FY92-94:[72]

Table 3. Minuteman Crew Member Education Program

		FY92	FY93	FY94
44MW Ellsworth AFB	Amount ($K)	467	319	49
South Dakota	Degrees	*	*	*
90MW FE Warren AFB	Amount ($K)	430	453	565
Wyoming	Degrees	47	37	29
91MW Minot AFB	Amount ($K)	193	276	426
North Dakota	Degrees	28	23	35
321MW Grand Forks AFB	Amount ($K)	224	323	322
North Dakota	Degrees	36	38	33
341MW Malmstrom AFB	Amount ($K)	317	384	455
Montana	Degrees	28	23	35
351MW Whiteman AFB	Amount ($K)	307	374	208
Missouri	Degrees	9	40	34

Source: Education Offices at missile bases

NOTE: Degrees attained for the 44th Missile Wing , Ellsworth AFB, South Dakota, are unavailable as the wing deactivated on 4 July 1994. The Education office at Ellsworth AFB did not retain this information.[73]

MCMEP enrollees have earned 475 graduate degrees in this three year period. The decrease in funds between FY93 to FY94 at the 44th Missile Wing was due to wing deactivation. The increase in cost, approximately 65 percent, between FY93 to FY94 at the 91st Missile Wing was caused by increased participation in the program prompted by the emphasis placed on graduate education by wing leadership.[74] During FY95, MCMEP will spend approximately $2.1 million. In FY96, the program is projected to spend $2.2 million.[75]

The second MAJCOM initiative that funds off-duty voluntary education is Air Force Material Command's (AFMC) Commander's Military Acquisition Training Program. The program's purpose is to develop acquisition professionals who will in the future occupy top acquisition management positions.[76] This program applies to all officer and enlisted AFMC military personnel assigned to an acquisition coded position.[77] Courses covered by the program are funded at 100 percent, to include tuition, matriculation fees, required textbooks and any other special fees.[78]

Acquisition disciplines covered in the program include, program management, communications/computer systems; contracting, purchasing, and industrial property management; systems planning, research, development and engineering; test and evaluation; manufacturing and production; quality and assurance; acquisition logistics; and business, cost estimating and financial management.[79] As this program was recently implemented by AFMC, the only available data is from last fiscal year. In FY94, the Commander's Military Acquisition Training Program cost $1.9 million and had 1712 people enrolled.[80]

Education and Training Paradigms for Business and Industry

"Employee education and development represent the key to future organizational performance and productivity. If employees are the engine driving corporations today, then training—comprehensive and continuous—is the fuel."[81] Continuous training or "life-long learning" is a significant buzz word in the corporate world today. Companies are investing significant resources and are becoming more involved in support for education programs. For instance, General Motors paid for one employee's master's

degree in psychology. Now the 30 year old assembler would like to be an ex-assembler and become a psychologist. Is this good for the company? "Yes," says the United Auto Workers (UAW). The UAW believes that advanced education is good for the union members, it is good for the company, and it's good for the economy that stands to benefit from more skilled workers.[82]

Cost-benefit analysis of education and training is difficult. When it comes to direct job-related "training," the advantages to the individual and institution are clear—individuals must be trained in the nuts and bolts of how to do their jobs. In addition, Laurie Bassie writes that there is increasing public policy focus on the need to develop systems in which workers' skills could be continuously upgraded. She defines these programs as ones that provide instruction for hourly workers in one or more of the following: reading, writing, mathematics, speaking and understanding English, preparation for the general equivalency degree (GED), problem solving, or interpersonal skills.[83] However, as outlined in the limiting factors sections of this paper, straightforward job training is not the major focus of this study. It is clearly the employer's responsibility to train employees to perform their jobs safely and properly. Cost-benefit is less clear when you move from "training" to "education."

> If reengineered processes require that people not follow rules but rather that they exercise judgment in order to do the right thing, then employees need sufficient education so they can discern for themselves what that right thing is. Traditional companies typically stress employee training—teaching workers how to perform a particular job or how to handle one specific situation or another. In companies that have reengineered, the emphasis shifts from training to education—or to hiring the educated. Training increases skills and competence and teaches employees the "how" of a job. Education increases their insight and understanding and teaches the "why.[84]

Unfortunately, "nobody's got that evidence"[85] of increase company productivity paying for education not directly related to the employee's job. According to Sanfort in his Air University study, "to prove the quantitative contributions of formal education (to executive performance) may remain impossible."[86] Additionally, he quotes one researcher as saying that the "value of education might have to be accepted on faith."[87]

Sanfort also cites an older (1962) Michigan State study that attempts to determine the value of these educational programs. Seven hundred and fifty large corporations were surveyed and the specific contributions of these programs, as the companies evaluated them were as follows:

> . . .we feel these programs have a definite contribution to make. They let (executives) get away from the day-to-day pressures of the job and from the restrictive "party line" thinking that exists in most companies and allow them to do some more relaxed thinking and some healthy self-analysis. The broadening experience of rubbing elbows with (executives) from a variety of company backgrounds is also very worthwhile. (Executives) learn from each other; they discover that other companies have faced problems similar to theirs and have arrived at different solutions. In a good program, too, (executives) have will be brought up to date on new developments that they have not as yet learned about—they will be 'updated.'[88]

One easy correlation is that of salary to education level. Even though industry as a whole cannot put a numerical value on the benefits of education per se, they reward it by virtue of higher salaries and increased advancement opportunities. Then why is the lifelong learning concept spreading, if there's no quantitative proof it helps productivity? It is not only, as Laurie Bassi says, "because everybody believes it does."[89] but because, as Lance states in his Air University study, ". . .since managing is a continual process of making decisions, and understanding of humanities and social sciences—the inter-relationships of

social, political and economic trends in society—broadens one's perspective and enables him to make better decisions."[90]

> There are many ways to profit from knowledge. Some are very lofty and some rather mundane. Some come from experience and some necessitate study. Some require an understanding of how to deal with people and some of how to deal with things. However it is acquired, however it is applied, knowledge is of central importance to a thriving economy.[91]

How is this knowledge obtained? A review of available studies shows that employee sponsored educational programs is on the rise. According to the U.S. Chamber of Commerce, in 1991, employee educational assistance is a benefit provided by 86 percent of the manufacturing industry and 76 percent of the non-manufacturing industry. Ninety-two percent of insurance firms reported providing educational assistance to their employees, while better than 80 percent of food, beverage and tobacco, petroleum, instrument, public utilities and banking and finance firms reported providing such assistance.[92]

Studies show that this type of employer provided tuition assistance programs are relatively free of restrictions. This is important because employees receiving tuition assistance from their employers constitute the greatest proportion of part time students receiving aid of any kind. Forty-five percent of the companies have no explicit maximum, reimbursement amount. Employees in 34 percent of the companies are subject to total credit hour restrictions. Forty-four percent of the companies set dollar amounts for tuition reimbursement. Employees share tuition costs at 45 percent of the companies and only 12 percent of the companies set minimum grade point averages as a condition of tuition reimbursement.[93]

This evidence is supported by a telephone incidence survey made by the research team. Several large companies were contacted to inquire about their education and tuition reimbursement policies.[94] All companies were asked the following questions:

1. Does your company sponsor any educational programs? What types of education are funded by company? Any courses? Courses directly related to job held/career track? Courses only applicable to degree (any degree?)? Only undergraduate or graduate also?
2. What number of courses are funded by company in any one year? Can employee be full-time student (4 or 5 courses per term?)?
3. Can courses be taken during normal work hours? During meal period? or Taken on own time?
4. Does employee pay any portion of course expenses? Tuition? Fees? Books? 100 percent or lower?
5. Is there a commitment owed to company in terms of service time after completion of course? or Must reimburse company money if time commitment not fulfilled?
6. Why does your company offer these program? What value do you receive from this program?

Results of this survey are summarized below:

Table 4. Corporate Telephone Survey Results

Questions	Manufacturing (percent)	Non-manufacturing (percent)
Fund a TA Program?	83	84
	of these companies:	
Pay 100 percent tuition?	82	80
Pay 75 to 100 percent of tuition?	18	20
Fund any degree work?	82	80
Fund job related work?	18	20
Require a time service payback?	0	0
Courses funded per year?	8	7

Source: Twenty-five Corporate Telephone Surveys

The trend for companies is to reimburse employees for any course, whether it is degree related or not, as long as the course is related to the needs of the company or is related to the future career direction of the employee. The policies among the companies

contacted were very flexible with little or no requirement for a time or dollar payback provision specified in the policy. Most companies paid the entire tuition and fees amounts, with books being excluded, but the company reimbursement amounts ranged from 75 percent to 100 percent.

One interesting aspect of employee education that surfaced through this research is the question: is there a concern that companies are educating workers only to see them stolen away by competitors or, in the case of the military, have them leave for civilian life at the first opportunity? In the January 1995 Training Magazine, Waterman and Noer argue that, ideally, it is a good idea to educate employees so some can leave your company. In this way, they say, you completely sever the umbilical cord that encourages unhealthy dependence.[95] But realistically, as Hewlett-Packard's director of Education, Claudia Davis says "We don't want to lose people because the knowledge goes right out the door."[96]

However, that concern doesn't stop Hewlett-Packard from educating people and it has one of the lowest turnover rates in the electronics industry. It creates a paradox that seems to run two ways. First, according to Robert Waterman, "companies should be training (educating) people so they can leave."[97] Second, if an employee increases his or her skills by furthering their education, they make themselves more valuable to their employer and thus increase their job stability.[98]

The bottom line is that educational opportunities in business and industry are important. Even if the benefits are perceived as "a matter of faith," studies have shown that the outcomes derived from educational programs are definitely worth pursuing. This is just what the vast majority of civilian companies are doing—pursing knowledge for their

employees because they firmly believe that a better educated employee is a better overall employee.

Education Paradigms for Other Military Services

Educational opportunities available to service members in the Army, Navy, Marine Corps, and Coast Guard can be a key indicator to the importance placed on education in the retention, recruitment, and career development of our soldiers, sailors, and marines. However, the importance placed on education and funds for education varies between each service. This section will discuss educational opportunities and cost, as well as rank versus education between each of our sister services.

Army. The prime reason individuals give for enlisting in the Army is to continue or increase one's education.[99] Even though the Army is reducing in size, the dollars spent for education is increasing every year. Other than TA, there are no special programs available that funds off-duty voluntary education. As with most programs during these fiscally constrained times, the demand for TA outstrips the dollars available. In order to keep TA available to all soldiers, the guidelines for using this program in FY95 changed from FY94 due to a $4 million shortfall.[100]

In FY94, the Army funded 75 percent of tuition, but no more than $85 per semester hour for a soldier pursuing an undergraduate degree. For FY95, the Army funds 75 percent of tuition; but not more than nine credit hours per soldier per year.[101] In addition, first and second year students are reimbursed at $60 per semester hour while third and fourth year students are reimbursed at the FY94 rate of $85 per semester hour.[102]

The nine credit hour limitation per solider per year will not have a detrimental effect on individuals pursuing a degree. Only 10 percent of the soldiers taking college level courses take nine semester hours or more per year. The average participating soldier takes approximately 1.4 courses per year.[103]

For soldiers pursuing a graduate degree, the reimbursement rate this fiscal year is the same as it was in FY94. The Army reimburses 75 percent of tuition, but no more than $170 per semester hour.[104] The only caveat to these restrictions are courses conducted outside the continental United States. These courses are reimbursed at the Tri-Service contract rate which is variable based on location.[105]

The following table highlights enrollments, degrees completed, and TA expenditures for FY91-93.[106]

Table 5. Tuition Assistance Statistics for the Army

	FY91	FY92	FY93
INDIVIDUAL ENROLLMENTS			
Uudergraduate	241770	229011	265927
Graduate	20321	16523	18543
DEGREES COMPLETED			
Associate	2112	2345	4588
Baccalaureate	2233	2182	1051
Graduate (Note 2)	1052	1238	965
EXPENDITURES ($M)			
Tuition Assistance	31.8	38.2	40.2

Source: DANTES Voluntary Education Statistics

Note 1: Fiscal year 1994 data was unavailable because DANTES, the Defense Activity for Non-Traditional Education Support had not received OSD approval for release.[107]

Note 2: The Army reports both master's and doctorate degrees under graduate degrees.

Table 5 shows a steady increase in TA costs from FY91-93 during the same time period the Army was reducing its force structure. Additionally, TA not only funds college level courses but funds high school completions (947 in FY91, 439 in FY92, and 644 in FY93), non-credit courses (language, military specialty, and basic skills), as well as traditional college degrees.[108]

The increase in enrollments in both undergraduate and graduate degree programs is due to the post-Desert Shield/Storm draw-down of people trying to improve their education. This was due in part to two factors. First, were individuals who wanted to improve their marketability for civilian employment while the second factor were those individuals planning to stay in the military and wanted to improve their promotion opportunity.[109]

Table 6 shows total expenditures for voluntary education during the same time period.[110]

Table 6. Army Voluntary Education Expenditures

EXPENDITURES ($M)	FY91	FY92	FY93
Personnel	38.1	35.6	39.5
Contract (non-instructional)	6.6	9.1	6.3
Contract (instructional)	6.5	7	6.1
Tuition Assistance	31.8	38.2	40.2
TOTAL ($M)	83	89.9	92.1

Source: DANTES Voluntary Education Statistics

The Army's voluntary education budget is the largest of any service. This is not due to TA alone but to over $35 million spent per year in personnel costs. Personnel cost includes funding for counselors and personnel working in education at each Army installation.[111] Additionally, the Army's cost for non-instructional contracts is the largest of any service due to the large numbers of learning centers the Army maintains.[112]

To get a different snapshot of Army education, the next table outlines Army education versus rank for both the officer and enlisted force. This table reflects Army personnel education versus rank as of June 1994.[113]

Table 7. Army Education Versus Rank

Grade	Unknown	No High School	High School	AA/AS	BA/BS	MA/MS	Ph.D.
E1	80	409	24902	305	1054	47	5
E2	73	265	33984	175	679	34	9
E3	75	320	57494	1339	157	7	8
E4	93	584	118353	2546	3447	100	17
E5	44	273	82393	3369	2516	99	12
E6	21	48	58187	7598	2852	237	8
E7	12	21	34863	7708	2721	306	7
E8	7	9	7508	2586	1040	204	5
E9	1	3	1770	988	457	98	1
W1	1216	0	232	353	291	22	0
W2	1345	0	1195	1909	995	92	2
W3	273	0	475	1709	793	143	1
W4	95	0	129	718	578	158	1
W5	5	0	10	87	121	28	1
O1	899	0	32	44	8218	130	2
O2	358	0	33	81	8831	316	2
O3	512	0	71	85	19273	6503	99
O4	86	0	10	3	5197	9768	200
O5	87	0	4	1	1561	7883	329
O6	21	0	2	2	202	3685	176
O7-10	5	0	0	0	12	318	13

Source: US Army Education Services

There is a correlation between those soldiers desiring promotion to the top three enlisted ranks and their educational level. The percentage of those individuals who have earned an associates degree or above increases from 24 percent at E-7 to 34 percent at E-8 to 47 percent at E-9.[114] As an officer increases in rank, it appears a master's degree is a potential discriminator in his or her ability to be promoted as 84 percent of the lieutenant colonels (O-5) and 94 percent of the colonels (O-6) having earned at least a master's degree.[115]

Informal discussions with an Army officer at ACSC, Major (Sel) Brad Greene, Intelligence Acquisition Officer, supports these findings. In his opinion, while an education is not officially required for promotion, it is highly encouraged and definitely enhances ones ability for promotion to the senior enlisted ranks.[116] Likewise, having a master's degree is a discriminator for promotion to major; however, it becomes a prerequisite for promotion to lieutenant colonel.[117]

Navy. Education is an integral part of a sailor's professional development. Frances Kelly, Chief of the Navy's Voluntary Education Program stated,

> Regardless of downsizing, the use of educational services is going up, and I think that's very understandable. For those making a career of the Navy, education makes them more promotable. For those leaving the Navy, it makes them more competitive outside. They know this."[118]

The United States Navy manages two programs that fund off-duty voluntary education, the Program for Afloat College Education (PACE) and TA. These programs provide sailors the ability to increase their educational levels at a reduced cost.

The Navy reviewed modifying TA reimbursement from the previous year's level in order to control costs; however, they did not do so. Consequently, the Navy has a $1.9 million shortfall in the TA program for FY95.[119] To stay within budget, one option is to curtail graduate level TA for enlisted personnel.[120] Tuition Assistance reimbursement is the same in FY95 as it was last fiscal year.[121] For a sailor pursuing an undergraduate degree, the Navy funds up to 75 percent of tuition, but not more than $285 per course. For Graduate study, the Navy funds up to 75 percent of tuition, but not more than $395 per course. Table 8 highlights, degrees completed, and TA expenditures for FY91-93.[122]

Table 8. Tuition Assistance Statistics for the Navy

	FY91	FY92	FY93
INDIVIDUAL ENROLLMENTS			
Undergraduate	125120	136428	129200
Graduate	10835	12652	14393
DEGREES COMPLETED			
Associate	2013	1406	1310
Baccalaureate	1164	1216	1239
Graduate	497	420	480
Doctoral (Note 2)			
EXPENDITURES ($M)			
Tuition Assistance	20.2	24.5	23.8

Source: DANTES Voluntary Education Statistics

Note 1: Fiscal year 1994 data was unavailable because DANTES had not received OSD approval for release.[123]

Note 2: The Navy did not report doctoral degree information.

Tuition Assistance not only funds college level courses but funds high school completions (116 in FY91, 164 in FY92, and 151 in FY93), non-credit courses (military specialty and basic skills), as well as traditional college degrees.[124] Naval personnel from FY91 to FY93 have earned over 9700 associate, bachelor, and master degrees. This number is impressive since a significant portion of the Navy deploys and are unable to use TA. A program to handle the needs of the deployed sailor will be addressed later in this report.

Table 9 shows total expenditures for voluntary education in the same time period.[125] Funding information on PACE will be reported later.

Table 9. Navy Voluntary Education Expenditures

EXPENDITURES ($M)	FY91	FY92	FY93
Personnel	6.9	7.3	6.9
Contract (non-instructional)	0.007	0	0.1
Contract (instruction)	5.6	6	5.9
Tuition Assistance	20.1	24.5	23.8
TOTAL ($M)	32.607	37.8	36.7

Source: DANTES Voluntary Education Statistics

The Navy spends significantly less money than the Army for voluntary education. However, a direct comparison cannot be accomplished due to the differences in size and missions of the two services. Sailors deployed on ships and submarines may not be in port long enough to use TA. The next program to be discussed supports those sailors who deploy for up to six months at a time.

PACE I offers pre-college and college courses to sailors assigned to deployed ships and funds 100 percent of the tuition.[126] PACE I classes are only available on ships deployed for 3 consecutive months or more from their homeport. The contractor for the program, Central Texas College, provides instructors to teach four pre-college and 117 college courses. Civilian instructors either deploy with the crew, or are flown to meet the ship at a later date. Instructors teach a full load of four courses per 6-8 week term, allowing ships to make numerous college courses available to sailors throughout deployment. PACE allows sailors to earn college credit the traditional way by going to class, attending lectures and completing challenging assignments while at sea. PACE I courses are fully accredited and can lead to the completion of an associate degree.

Central Texas College is part of the Service Members Opportunity College Navy Consortium (SOCNAV).[127] SOCNAV is a worldwide network of 63 colleges and

universities offering degrees in areas of study related to Navy ratings. This program helps sailors earn college degrees despite transfers to other locations.

Another program developed to support the deployed sailor is PACE II. PACE II is the Navy's technology-based college-level education system.[128] The program is for sailors on submarines and small ships that have a crew size less than 350 and cannot accommodate a college instructor. Additionally, the program is available to sailors stationed at two remote locations, Antarctica and Andros Island. College courses are available in three modes: video instruction, computer assisted instruction, and computer interactive video instruction. The contractor provides the necessary hardware and software and student materials along with crew briefings and counseling. Students complete lessons and exams at their own pace.

The following colleges and universities are under contract for PACE II: George Washington University, Oklahoma University, Coastline Community College, and Richland College.[129] Hardware and software required for on-board instruction is loaded before deployment. Students work independently on course materials; however, the student is not alone in this process. A shipboard support team monitors each student's progress and administers the exams. Upon returning to port, the hardware and software are off-loaded, reviewed and final grades are assigned.

Table 10 highlights the enrollments and costs for PACE I and II from FY91-94.[130]

Table 10. Enrollments and Funding for PACE I and II

		FY91	FY92	FY93	FY94
PACE I	Enrollments	19793	20799	18456	17177
	Funding ($M)	3	2.9	2.6	3.7
PACE II	Enrollments	1817	1738	2469	3910
	Funding($M)	1.1	1.1	1.3	2
TOTAL ($M)		4.1	4	3.9	5.7

Source: US Navy Voluntary Education Department

PACE I and II are extremely successful programs that provide educational opportunities to individuals who otherwise would not have it available to them. Due to the positive impact these programs have had, the Chief of Naval Operations, Admiral Borda, wants to increase them to all ships in the Navy.[131]

To get a different snapshot of Navy education, Table 11 outlines education by grade for both the officer[132] and enlisted[133] force. This table reflects the Navy as of October 1994.

Table 11. Navy Education Versus Rank

GRADE	Unknown	No High School	High School	AA/AS	3 Yr Col	BA/BS	MA/MS	Ph.D.
E1	220	492	24298	7	0	4	0	0
E2	418	449	36065	13	0	7	0	0
E3	627	336	54687	637	0	945	20	0
E4	545	1693	79428	967	0	1620	20	4
E5	464	2761	86505	1601	0	2690	58	4
E6	390	3427	67891	2218	0	2357	122	2
E7	173	1162	27715	1453	0	1304	106	6
E8	41	565	7599	449	0	469	55	1
E9	26	97	3534	329	0	208	12	3
W01	10	0	0	5	0	0	0	0
CW02	950	0	34	80	11	103	7	0
CW03	605	0	47	58	8	109	17	0
CW04	330	0	41	53	4	59	16	0
O1	1643	0	22	36	13	4706	56	2
O2	1250	0	37	85	33	6094	229	0
O3	3193	0	105	186	219	15490	4156	1589
O4	637	0	85	115	90	5145	6748	1833
O5	86	0	29	32	45	2706	5933	1095
O6	11	0	5	3	13	894	2944	822
O7-10	1	0	0	0	1	66	236	34

Source: US Navy PERS 10T

There are four issues in Table 11 that need clarification. First, there are 199 individuals out of 2,705 in the *unknown* enlisted column who have attended a three-year diploma school or various vocational programs, not determined to be licensed.[134] Additionally, some of the associate degree numbers in the grades 0-1 through 0-3 apply to individuals in the Naval Aviation Cadet Program. These individuals receive their commission after successfully completing aviation training.[135] Next, the three year college column pertains mostly to individuals in the Navy Nurse Corps who received their degrees via a nurse diploma program.[136] Finally, the abnormally high number of *unknowns* in the officer column is because officers are not required to update their educational records. One major reason is they may have received a degree in which they do not want the Navy to find out about.[137]

What is striking in Table 11 is the abnormally high number of enlisted personnel (10,982) who have not graduated from high school. The Navy, as does the other services, accepts a small percentage of individuals each year who have not completed high school. While it is understandable for those new enlistees to not have had the time to complete a high school certification program, those individuals above the rank of E-3 have had ample time to have earned their high school diploma. Conversely, over 17,000 enlisted individuals have attended some sort of college program and have received associate to doctoral degrees. Individuals in the ranks of E-7 through E-9 who have earned an associates degree or above are only 9 percent, 10 percent, and 13 percent respectively of these ranks. This information does not translate into a lesser value placed on education in the professional development of a sailor. However, it appears the Navy promotes enlisted personnel based on job performance and not on an individual's educational level.

As Table 11 indicates the officer corps from above the rank of Lieutenant (0-3) is highly educated. As an officer increase in rank a master's degree or above becomes a major discriminator in his or her promotion opportunity. This is not to say that without education an officer will not be promoted. However, with 71 percent of the Commanders (O-5) and 81 percent of the Captains (O-6) having earned a master's degree or more it appears an individual who lacks one could be at a disadvantage. A master's degree or above while not mandatory for promotion to 0-4, is a discriminator—as 59 percent of the Lieutenant Commanders have earned an advanced degree.

Marine Corps. Other than TA, the United States Marine Corps does not offer any other off-duty voluntary education programs. The Marine Corps has put limits on their TA program in FY95 in order to control costs, as the program is underfunded by $3

million.[138] For marines pursuing an undergraduate degree in FY95, the Corps funds, up to 75 percent of tuition, not to exceed $2,150 per fiscal year. While this is the same limit that was placed on the program last fiscal year, a new caveat to the program was added in FY95. The Marine Corps has limited each soldier to *no more than* 21 semester hours of courses per year.[139]

Limits have also been placed on marines using TA in pursuit of a graduate degree.[140] Graduate courses in FY95 are reimbursed up to 75 percent of tuition, not to exceed $3,000 per fiscal year. In FY94, the limit was $3,500, and as in undergraduate courses, each soldier is only allowed 21 semester hours per year.

Table 12 highlights enrollments, degrees completed, and TA expenditures for FY91-93.[141]

Table 12. Tuition Assistance Statistics for the Marine Corps

	FY91	FY92	FY93
INDIVIDUAL ENROLLMENTS			
Undergraduate	29180	38566	36365
Graduate	2684	3392	3725
DEGREES COMPLETED			
Associates	306	361	348
Baccalaureate	417	529	592
Graduate	252	296	283
Doctorate	5	20	9
EXPENDITURES ($M)			
Tuition Assistance	7.5	9.5	9

Source: DANTES Voluntary Education Statistics

Note: Fiscal year 1994 data is not included because DANTES has not received OSD approval for release.[142]

As one would expect, the Marine Corps has the smallest TA program of any service. Included in these expenditure figures are funds spent on high school completion's (462 in FY91, 521 in FY92, and 517 in FY93), non-credit courses (language, military specialty,

and basic skills), as well as traditional college degrees.[143] However, the program is very active with over 3400 degrees earned by marines in this three-year time period. Table 13 shows total expenditures for voluntary education in the same time period.

Table 13. Marine Corps Voluntary Education Expenditures

EXPENDITURES ($M)	FY91	FY92	FY93
Personnel	0.3	0.5	0.6
Contract (instructional)	0.08	0.02	0.09
Tuition Assistance	7.5	9.5	9
TOTAL ($M)	7.88	10.02	9.69

Source: DANTES Voluntary Education Statistics

Table 13 reflects that over 92 percent of the money the Marine Corps spends on education is spent in the TA program. To determine one benefit of having an advanced degree, the next table outlines education versus rank for both the officer and enlisted force. This table reflects the Marine Corps as of February 1995.[144]

Table 14. Marine Corps Education Versus Rank

GRADE	Unknown	No High School	High School	AA/AS	BA/BS	MA/MS	Ph.D.
E1	27	27	10693	7	6	0	0
E2	0	28	18816	62	115	3	0
E3	0	44	42645	211	296	5	0
E4	1	27	30226	277	238	5	0
E5	26	26	21212	465	292	5	0
E6	0	23	12610	580	348	42	1
E7	0	18	7703	443	327	72	2
E8	0	7	2650	180	156	25	0
E9	0	1	1094	84	76	17	2
W1	0	0	218	29	21	5	0
W2	0	1	514	94	81	14	0
W3	0	0	372	70	97	5	0
W4	0	0	196	29	56	15	0
W5	0	0	24	1	8	1	1
O1	82	0	51	4	1968	4	0
O2	13	0	14	6	2938	31	2
O3	2	0	227	50	4716	331	18
O4	0	0	103	16	2080	815	26
O5	0	0	26	11	806	739	14
O6	0	0	7	1	234	383	4
O7-010	0	0	0	0	21	47	0

Source: USMC Manpower Management Division

Table 14 shows that the highest degree that the majority of enlisted personnel have attained is a high school diploma. For the officer corps, the highest level of education the majority have attained is a bachelor's degree. For those individuals who desire promotion to the top three enlisted ranks, the percentages of individuals who have earned an associates degree or above in the ranks of E-7 through E-9 are approximately 10 percent, 12 percent, and 14 percent respectively of these ranks. This information does not translate into a lesser value that education has in the professional development of an enlisted marine.

Informal discussions with a Marine Corps Officer, Maj Jeff Marshall, Aviation Officer, at Air Command and Staff College supports these findings. In his opinion, enlisted

personnel are not required, nor do they need an advanced degree for promotion to the senior ranks of the enlisted corps. In addition, having a master's degree does not become a discriminator in the officer corps until the rank of 0-6.[145] Even as an individual rises to the general officer level in the Marine Corps, a master's degree is not a mandatory item the individual needs for success, as one-third of the general officers have earned only a bachelor's degree.

Coast Guard. The Coast Guard, while not a member of the Department of Defense during peacetime, is an armed service and thus participates in the TA program. Tuition Assistance is the only program that supports off-duty voluntary education in the Coast Guard. The Coast Guard, like the Army and Marine Corps, has altered their TA program in FY95 from FY94 in order to control costs.[146]

In FY94, for undergraduate and graduate education, the Coast Guard funded up to 75 percent of tuition, not to exceed the cost of the most expensive nine credit hours within geographic limits. In FY95 members are still reimbursed at the 75 percent level; however, administrators of TA accounts, in response to a limited availability of funds, may impose a quarterly or annual limit on the amount of TA each individual may receive.[147]

The Coast Guard has established a priority in its funding concerning TA.[148] Priority 1 is courses leading to a high school diploma or GED certificate (TA funds 100 percent for these courses). Priority 2 is college courses taken for the specific purpose of applying for an officer commissioning program. Priority 3 is college courses leading to an associate, baccalaureate, or graduate degree (with priority given to associate and baccalaureate courses).

Historical funding and enrollment statistics for TA are unavailable for the Coast Guard.[149] DANTES does not track the Coast Guard TA program because they are not part of the DoD. Additionally, neither the Coast Guard Headquarters nor the US Coast Guard Institute, Academic Development Division, track historical TA information. TA is disbursed at the division level and the headquarters does not track these funds.

To get a snapshot of Coast Guard education, Table 15 will outline education by grade for both the officer and the enlisted force. Table 15 reflects the Coast Guard as of January 1995.[150]

Table 15. Coast Guard Education Versus Rank

GRADE	No High School	High School	AA/AS	BA/BS	MA/MS	Ph.D.
E1	0	418	0	0	0	0
E2	3	2176	34	59	0	0
E3	8	3751	68	111	0	0
E4	38	6597	81	97	0	1
E5	127	5419	131	104	3	0
E6	217	5198	126	135	15	1
E7	98	2575	85	62	4	1
E8	10	523	22	13	1	0
E9	2	267	7	6	2	0
W2	11	593	38	32	4	0
W3	4	415	29	29	1	0
W4	1	345	18	17	3	0
O1	1	77	5	535	9	0
O2	4	211	30	1018	19	0
O3	3	296	44	1172	93	22
O4	1	134	9	785	172	13
O5	0	57	4	450	219	15
O6	0	17	2	128	221	16
O7 - O10	0	0	0	8	12	4

Source: Academic Development Division, Coast Guard Institute

The Coast Guard has very few enlisted members who have earned a bachelor's degree. As an individual increases in rank to the upper levels of the enlisted force, the percentage of those who only have a high school diploma increases (91 percent at E-7, 92 percent at

E-8, and 94 percent at E-9). Higher ranking officers tend to have higher education level. Only 17 percent of Coast Guard Lieutenant Commanders and 31 percent of the Commanders have earned a master's degree or above. However, it appears the only rank where having a master's degree is commonplace is 0-6 where 62 percent have earned a master's degree. Even as an individual rises to the flag ranks, a master's degree is not a mandatory item for success, as approximately one-third of flag officers have not earned their master's degree.

CHAPTER 3

Methodology

A TA (Graduate and Undergraduate Voluntary Education) Program Working Group convened at Maxwell AFB in August 1994 to develop a charter/research thesis for the study. Briefings provided by HQ AF/DPPE, HQ AETC/DPAE, and HQ AETC/TTP personnel established the history of the tasking, and provided background on TA programs for the working group. The group formulated the overall objective and tasks that were included on the ACSC research topic list. Eight ACSC students and faculty members and an Air Force Reserve Individual Mobilization Augmentee (IMA) to the AU Provost, comprised the research group formed in response to the research request. Students and faculty members from a broad spectrum of Air Force specialties, as shown in the attached vita, brought varied perspectives to this research effort. This chapter describes the methodologies used in the Daedulus Content Analysis and the Air Force TA and Off-Duty Education Survey.

Daedalus Content Analysis Methodology

The primary focus of this part of the research was gaining a greater understanding of the need/perceived need for advanced academic degrees. Aside from the documented, fully funded requirements for advanced degrees, is there a need for other graduate degrees in the various career fields found in the US Air Force? A secondary purpose was to make inferences as to possible requirements for several of the outcomes of higher and advanced education. How many job advertisements contain references to required/desired traits that are outcomes of advanced degrees in management related fields?

Content analysis was the research technique employed for this part of the project. Broadly defined, content analysis is "any technique for making inferences by systematically and objectively identifying specified characteristics of messages."[151] The benefit of this technique in the present circumstances was that it provided a nonobtrusive means of gaining meaningful information using an existing pool of information.

The USAF Daedalus job advertisement database was used in the study. The study was limited to two broad line officer categories present in Daedalus: rated/non-rated operations and mission support. The database was updated for February 27, 1995. The recording units of analysis were words or terms used to advertise positions for USAF officers in the Daedalus database. These terms can be viewed in the analysis codebook, Appendix B. The codebook was used as a recording instrument to establish consistency in scoring individual job advertisements. The form was arranged in four sections.

The first section, Communication Skills, was intended to record those job descriptions/requirements that related to briefing and writing abilities. Communication skills were selected as categories for several reasons. First, they are nearly universally practiced in master's level programs. Students are often asked to brief, debate, and argue their points and findings. Similarly, graduate level programs require students to express their thoughts, analysis, and synthesis in writing. Since it is generally believed that practice in these disciplines can lead to greater proficiency, they were established as separate categories for study. Orphen[152] describes how many business schools develop their students' communication skills by requiring graded oral and written presentations. This forces the students to practice these skills using "real world" material and has the side benefit of encouraging a more logical approach to their arguments. The codebook scored

communication skills by looking for key words. Both briefing and writing were scored if a generic requirement such as "strong comm skills needed" was used in the advertisement.

The second section, Leadership Skills, was used to record job attributes that fell into two basic categories: Functions of Management and Supervising. The researchers selected managerial functions of the broadest measure such as planning, organizing, controlling, and directing. Reinecke[153] defines planning as "preparing a firm to cope with the future." Regardless of the level of planning expressed in the Daedalus job advertisements, one can argue that formalized education in that discipline would probably lead to higher individual performance. Organizing is the "management function of relating people, tasks (or activities), and resources to each other so that an organization can accomplish its objectives.[154] A potential benefit of graduate education is that officers may better understand and apply a systems approach in the workplace, resulting in more efficient administration of people, tasks and resources. Directing and controlling occur when plans are carried out within an organization and mechanisms are employed to ensure results are as desired.

The Supervising category was used to record terms which expressed or implied that the officer would be in charge of people. Terms such as "supervises," "commands," and "leads," were recorded in this category. Although traditional professional military education schools educate officers in the art and practice of leadership, the topic is also covered in a general management-related master's degree. In the management program, students learn of classic and contemporary leadership models and supervisory techniques. In addition, they are introduced to recent work in human motivation theory as well as other human resources topics.

The third section, Degree Desired/Mandatory, was used to record a desire or expressed requirement for an advanced degree. Within the job advertisements, one often finds desired and/or mandatory qualifications. For purposes of this study, no distinction was made between desired and mandatory requirements. It was felt that the very act of including the advanced degree in the job advertisement made it important enough to study and consequently record. The degrees were scored in one of eight degree categories. The first seven categories were taken from the Graduate Record Examination (GRE) Board and the Council of Graduate Schools (CGS) Directory of Graduate Programs series.[155] Each category will be briefly expanded upon.

The Arts included those degrees dealing with the performing arts. Since none of the degrees in this study were placed in this category, it was excluded from further analysis and discussion. The Business category included accounting, business administration, management, finance, operations research and other related disciplines. The Education category included advanced degrees in education, research, curriculum and education administration. Engineering included disciplines such as chemical, civil, electrical, electronics, industrial, materials, mechanical engineering, computer/information science. The Humanities category included advanced degrees in literature, history, and philosophy. The Natural Sciences included related disciplines such as biology, geology, chemistry, physics, astronomy, meteorology, and mathematics. Graduate requirements in the Social Sciences category includes the disciplines of sociology, economics, psychology, political science, and public administration. The final category, Any Advanced, was used as a column to record those job advertisements which suggested a graduate degree was

required, but did not suggest a specific discipline. Job advertisements which scored in this category generally referred to "master's desired/required" or "MA/MS desired."

The final category, Advanced Management-Related Degree, was used to record the researchers' assessment that an advanced management-related degree would be useful for the described job. A management related degree was selected because historically, that tended to be the most popular type of degree conferred to military officers. A 1977 study[156] showed that over 50 percent of advanced degrees held by Air Force officers were in the field of management/business. In order to objectively make this assessment several rules were followed. First, no job which already had a desired/mandatory requirement for an advanced degree was considered. It was felt that one advanced degree program might fulfill the requisite skills in communication skills and leadership skills. Secondly, the aforementioned categories of Briefing, Writing, Functions of Management, and Supervising were used as indicators of a need for these particular skills that might be enhanced by an advanced degree in a management related field. Using these data, a weighted scoring system was employed. Since briefing and writing outcomes were somewhat narrow outcomes, they were assigned a weight or score of "1" each. On the other hand, the broader, and arguably more significant categories of Functions of Management and Supervising were assigned a score of "2" each. A job was recommended for an advanced degree in a management related discipline if, based on the job description, it attained a score of at least "3" out of a possible "4."

Content validity of this methodology was strengthened by a "dry run" of 200 job advertisements. It was conducted by two of the researchers. First, the researchers worked independently to test consistency in scoring. As a result of this process, several

modifications were made to the codebook in addition to numerous clarifications in terminology. In addition, the researchers worked together reviewing the test advertisements, clarifying interpretations of the often confusing non-standard abbreviations used by the manpower personnel.

Tuition Assistance and Off-Duty Education Survey Methodology

The TA and off-duty education survey described in the following sections was developed to establish an opinion-oriented baseline on TA and generic education programs. Data from the survey quantifies the opinions of future military leaders on TA and off-duty education programs. As discussed in Chapter 2, one of the Air Force's most important officer and enlisted recruiting tools is the promise of educational opportunities and programs. Unfortunately, recent funding shortages and the continuing military drawdown now jeopardize some of these programs. It is therefore essential to evaluate the perceived impact of changes in these programs on a number of personnel factors, including recruitment, retention, job performance and job satisfaction. The survey was developed to measure the opinions of PME students relative to TA and off-duty education, as well as their general feelings regarding use of education data for promotion and the "value of education." The survey was authorized by the Air University survey control monitor and designated Air University Survey Control Number (AU SCN) 95-03.

Survey Populations. The survey was administered to 2,290 in-resident officer and enlisted PME students during March 1995. In-resident PME students were selected as instrument subjects for several reasons. First, student attendees represent, both officer and enlisted, the future leadership of the Air Force and, as such, will be required to direct,

advise and supervise junior personnel and implement the programs referenced in earlier sections of this research project. It is important to note that, given attendance eligibility requirements, only Air War College (AWC) and ACSC, at 12 percent and 20 percent respectively, are selective to the extreme of not representing a good cross-section of personnel within the applicable grade or rank. Eighty-five percent of all Air Force company grade officers attend Squadron Officer School in-residence and the two enlisted schools boast a 100 percent attendance eligibility. The ease of approval and administration to AU PME students cannot be overlooked considering the small size of the research cadre and the complete lack of budget; however, as a follow-up study, a larger distribution to a randomly selected sample of all Air Force officer and enlisted personnel is ongoing. Because of the variety of military services, federal agencies, and international organizations represented in several of the PME schools, survey respondents were asked to complete the survey regardless of their service affiliation, country or military/civilian status. It was hoped that, even though small in number and probably not statistically significant, these respondents could provide an informative and interesting "shred" of data depicting educational programs, their importance and implementation in non-USAF organizations. The following paragraphs briefly describe each AU PME school and typical respondents at each.

Air War College is the senior professional school or senior service school in the Air Force educational system. It's primary objective is to improve the Air Force contribution to national security through joint education and senior leader development focused on military strategy and the employment of airpower. The core curriculum focuses on warfare studies, joint and combined theater operations and national and international

security policy issues. Class composition includes senior officers (lieutenant colonels and colonels or their equivalents) from all military services, civilians of equivalent rank from U.S. government agencies, and senior officers from approximately 40 foreign countries. The program is highly selective, conducted yearly, and class size is limited to 250. Approximately 12 percent of the Air Force senior officer corps attends AWC at some time during their career. A basic description of the class would equate to—future senior leaders of the Air Force.

Air Command and Staff College educates mid-career officers in the grade of major to develop, advance and apply air and space power. Specifically, it teaches military theory, air campaign concepts and professional skills to prepare in-residence officers for command and airpower employment. Students come from the U.S. military, DoD, other U.S. government agencies, and foreign countries. The program is conducted yearly and is comprised of approximately 580 students. Approximately 20 percent of all Air Force majors attend this Intermediate Service School.

Basic leadership, officership, communication skills and force employment are the curriculum areas covered at Squadron Officer School (SOS). Five 7-week classes each calendar year, with more than 640 students in each, are aimed at improving the professional competence of company grade Air Force officers (captains) and international officers and inspire their dedication to the profession of arms. A limited number of civilians and international officers attend each year. The sample size approximates a cross section of 85 percent of Air Force captains.

The Senior Non-Commissioned Officer (NCO) Academy is the “capstone” of enlisted PME. The 35 academic-day, in-residence course is conducted five times each year and is

typically attended by personnel in the grade of senior master sergeant. Leadership and management, communication skills, and military studies are emphasized in the curriculum. All senior non-commissioned officers are required to attend during their careers and each class has approximately 350 students.

The NCO Academies at Barksdale Air Force Base (AFB), Louisiana; Keesler AFB, Mississippi; Robins AFB, Georgia; and Tyndall AFB, Florida were asked to participate in the survey project by administering the instrument to their current in-resident classes. NCO Academies are mid-level enlisted PME courses designed to instruct in basic leadership, management and communication skills. They are overseen by the College for Enlisted PME (CEPME) and are conducted at a variety of locations across the Air Force. Students are in the grade of technical sergeant and attendance eligibility is 100 percent.

The follow-on survey was also mailed to a stratified sample of 1,000 Air Force personnel. This sample represents the demographics of the entire Air Force.

Survey/Instrument Construct. The actual survey is included at Appendix C.

Part I: Background Information. The initial section of the survey simply represented general background information required to quantify and categorize collected data. The seven basic respondent attributes were: highest educational level/status attained, current grade, military service affiliation, major command/organization or equivalent, primary specialty/career field or equivalent, current PME student status, and commissioning source (officers only).

Part II: Tuition Assistance. In order to adequately address the specific requirements/request by the research project "customers" it was necessary to devote an entire survey section, comprised of 20 questions, to the DoD TA Program. This section

began with a short description of the DoD TA program, then queried the respondent if they were familiar with the program and if they had ever used it. These baseline questions were developed to facilitate data collection and to quantify and categorize data. Additionally, as stand alone data, they represented a measure of the TA program's use and general education program advertisement among the sample groups.

All remaining instrument questions asked the respondent to agree or disagree with various statements based on a scale of 1 to 5 with "1" representing "Strongly Agree," "5" representing "Strongly Disagree" and "3" indicating "Neutral." Because of the nature of some questions, "6" was used to indicate "Not Applicable."

Survey questions 3 through 11 asked for respondent opinions on the TA program relating to the program's general value, value as an officer and enlisted recruiting tool, and program effect on improvements in officer and enlisted retention, job satisfaction, and job performance. These answers baselined general opinions on the TA program. The following questions (12 through 14) gauge opinions on perceived personal, officer, and enlisted participation in pursuing degrees without, or in the absence of, the TA program. Questions 15 through 20 measured perceptions on individual, officer, and enlisted participation in pursuing degrees given funding level decreases in the TA program from 75 to 65 percent and from 75 to 50 percent. These measures will be invaluable to TA program decision makers in any contemplated restructure or funding change to the existing program.

Part III: Education Program Opinion. This section was comprised of 29 questions responsible for measuring opinions on the general education programs of the Air Force as they relate to recruitment, promotion, job performance, job satisfaction, and

value. Significant indicators will be used to make general recommendations to the research project "customers" at Air University and Air Force senior leaders tasked with education program oversight and implementation.

Specific questions related to recruitment and retention (21 through 26) are phrased to measure individual, officer, and enlisted categories of educational opportunities/ programs effects on both initially joining and staying in the military. Promotion section questions 27 through 34 seek opinions on whether or not degrees and advanced degrees, for enlisted and officers respectively, are and should be major factors in promotions. Additionally, specific questions regarding the "masking" of educational data from officer and enlisted promotion boards (27 through 30) and the effect of "masking" on the pursuit of degrees (31 through 34) are included in this section. Opinions on job performance and job satisfaction effects of education for individuals, officers, and enlisted are asked in questions 35 through 40. The value section (questions 41 through 45) begins by measuring respondent opinions on personal and organizational value, as well as increased confidence, effects of education for officer and enlisted personnel. A final instrument component (questions 46 through 49) dovetails nicely with the content analysis section of the research project in that it measures opinions on educational pursuit effects of basic functions of management including, writing and briefing skills, critical thinking, and management/leadership techniques.

Survey Administration/Data Collection. Distribution of the survey was conducted by research team members via the Evaluation Divisions of each of the represented PME schools. Air University, Directorate of Plans, provided a survey tasking letter to each officer school commandant and one to the College of Enlisted PME (CEPME)

commander. Non Commissioned Officer Academies received tasking through separate CEPME/CC letters.

Due to several recent survey distributions in the PME community, key components of the instructions for each survey were the inclusion of adequate purpose and background information and the statement, “Completing this survey should take approximately 10 minutes.” It was hoped that these up front rationale and truthful assertions would encourage the maximum potential participants in completing the voluntary instrument.

CHAPTER 4

Data Description and Analysis

This chapter will present the results and analysis for both the Daedalus Content Analysis and the Air Force TA and Off-Duty Voluntary Education Survey. First, the results of the Content Analysis will be presented, then analyzed. This will be followed by the discussion of the Education Survey results and analysis. It is important to note that while the utmost academic rigor will be applied in the tabulation and analyses of results, this research project must be treated equally as both a decision staff package and an academically significant program. This project represents applied and theoretical research.

Daedalus Content Analysis Results/Analysis

The following table reports the results of scoring 3,506 job advertisements. There were 1,410 job advertisements targeting rated/non-rated operations officers. As expected, a considerably higher number of job advertisements were targeted to mission support officers: 2,096. Data for lieutenants were combined with that of captains due to the relatively small number of advertisements being targeted to the former group. For instance, there were only 30 advertisements targeted for rated/non-rated operations lieutenants. Data are reported by operations versus mission support, and within that delineation, by rank. The first number indicates the raw number of job advertisements that desired/required an advanced degree in the specialty adjacent to it. The second number indicates the number of job advertisements that indicated a funded requirement for the advanced degree.

Table 16. Type of Degree by Specialty and Rank

	Rated/Non-Rated Operations			Mission Support		
DEGREE	LT/CPT	MAJ	LT COL	LT/CPT	MAJ	LT COL
Business	4/0	3/0	2/0	21/3	10/2	5/2
Education	0/0	0/0	0/0	5/1	0/0	1/0
Engineering	6/1	2/0	0/0	37/20	16/1	15/0
Humanities	0/0	2/0	3/0	0/3	4/1	0/0
Nat Science	3/0	3/1	3/0	39/23	27/4	16/0
Soc Science	0/0	3/0	5/0	5/2	9/0	5/0
Any Master's	59/0	12/1	17/0	71/1	19/0	14/0
*Mgt Degree	49	41	15	92	50	34

When the data are reported by percentage of total master's degrees within a category, one can discern the most popular fields of study (Figure 4).

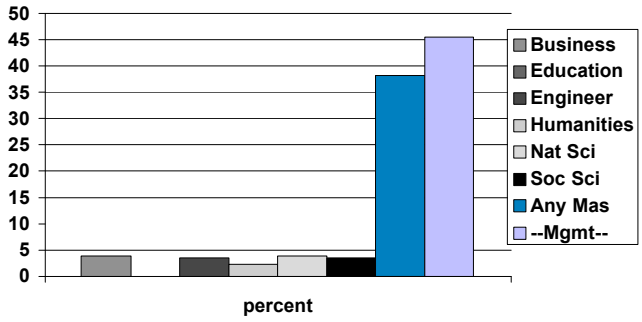

Figure 4. Rated/Non-Rated Ops Master's Degrees

In the rated/non-rated operations field, there was little requirement/desire for specialized advanced degrees. Over 37 percent of the master's degrees desired/required for this field fell in the "any master's" category. In addition, using the weighted job

attributes technique, the researchers suggest a master's degree in a management related field would be useful for over 45 percent of the master's degrees desired/required, or 105 of the 231. In the mission support field, it probably comes as no surprise that engineering and the natural sciences are highest in demand, totaling nearly 30 percent of all degrees desired/required (Figure 5).

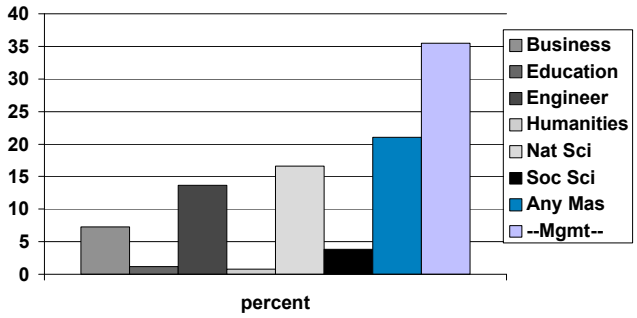

Figure 5. Mission Support Master's Degrees

It is interesting to note that the researchers concluded that an additional 176 management related degrees would be useful for those jobs whose advertisements expressed a desire/requirement for communication and leadership skills.

Another way of looking at the data is to study the overall percentage of job advertisements that either required/desired, or by merit of the ad's description would benefit from an advanced degree (Figure 6).

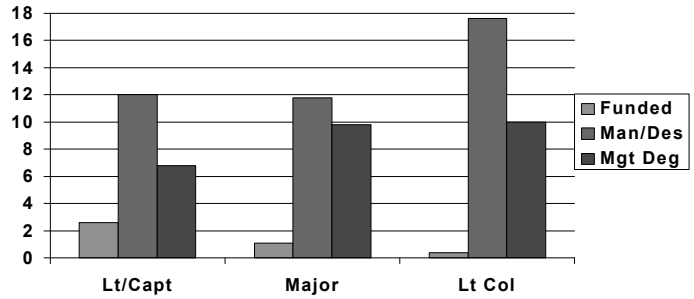

Figure 6. Job Ads—All Officers

Here the trend is clear, as an officer's rank increases to lieutenant colonel, the greater the likelihood that he/she will come across a job advertisement in which an advanced degree is desirable. When one examines the data by the categories of funded, mandatory/desired, and the researcher-designated management degree, several trends emerge. First, there seems to be an inverse relationship between funded degree requirements and rank. Secondly, the percentage of job advertisements desiring/requiring advanced degrees seems to remain relatively constant for lieutenants, captains and majors. On the other hand, the percentage of job advertisements desiring/requiring advanced degrees rises markedly for the rank of lieutenant colonel. In addition, the percentage of job advertisements that appear to suggest a management related degree would be useful tends to increase in the field grade ranks of major and lieutenant colonel.

Finally, the data can be broken down by percentages of degrees required based upon the three categories of funded requirements, mandatory/desired degrees, and management related degree. When looking at the mission support job advertisements one sees clear trends (Figure 7).

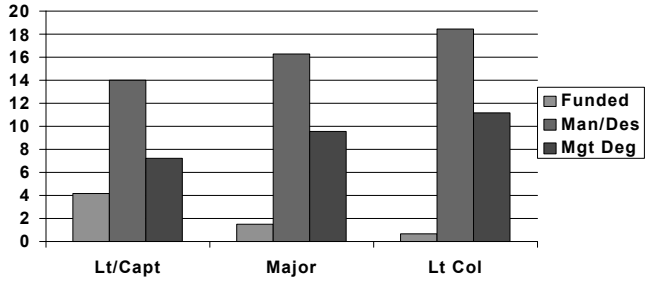

Figure 7. Mission Support Job Ads

First, the requirement for funded advanced degrees is inversely related to rank. The mandatory/desired requirements for advanced degrees are positively related to rank. Similarly, the percentage of jobs in which a management related degree would be useful is positively related to rank. The rated/non-rated operations fields show somewhat different trends.

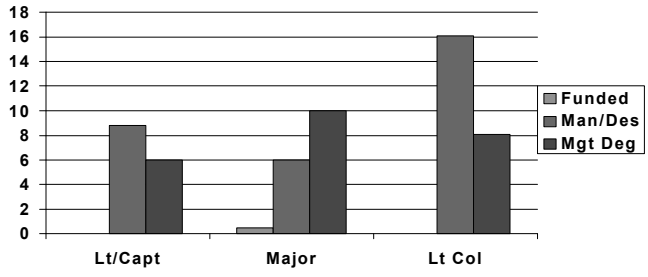

Figure 8. Rated/Non-Rated Ops Job Ads

In this field there is little funded requirement for advanced degrees. The percentage of advanced degrees that were listed as either mandatory/desired decreases for the rank of

major, yet more than doubles for the rank of lieutenant colonel. Conversely, the percentage of job advertisements that appear to need a management related degree decreases slightly from major to lieutenant colonel (from 10 percent to 8 percent). No suggestion is offered to explain this apparent discrepancy.

Given the limitation of this study, one should not use it to make generalizations about the population of jobs in the officer corps of the Air Force. It is only intended to provide some evidence that there may be a need (or perceived need) for advanced degrees. In that regard, it has been a useful tool in understanding that there is a greater need for graduate degrees among the officer corps in the USAF than merely those for which a funded advanced academic degree requirement exists. This greater need is expressed in two ways. First, the ultimate user of a job applicant has made that determination by expressing a requirement or a desire for a specific or general advanced degree in the Daedalus job advertisement system. In addition, the researchers suggest that based on the job descriptions/requirements expressed in the Daedalus job advertisements, a need for advanced degrees in management related fields may be useful to the officer in achieving success in that position.

Tuition Assistance and Off-Duty Education Survey Results/Analysis

The Air Force Tuition Assistance and Off-Duty Education Survey was administered to the selected samples during March 1995. Individual surveys were delivered in bulk quantities to selected survey administrators at the various PME schools. These administrators distributed the surveys to their respective student bodies, then collected the completed instruments and returned them to the research team. The following section

describes in detail the survey population using the seven background questions listed in Part I of the instrument.

The entire survey population was comprised of 1,687 PME students which represented a 74 percent response rate, based on 2,290 distributed instruments. Individual PME school participation rates are listed in Table 17.

Table 17. Survey Sample by PME School

PME School	Distributed Surveys	Returned Surveys	Percentage
AWC	250	83	33%
ACSC	570	328	58%
SOS	650	585	90%
SNCOA	360	352	98%
NCOA	460	339	73%
TOTAL	2,290	1,687	74%

Officers made up 59 percent of the sample, representing the Air War College (AWC), Air Command and Staff College (ACSC), and Squadron Officer School (SOS) participants; while enlisted personnel enrolled at either Senior Non-Commissioned Officer (NCO) Academy (SNCOA) or NCO Academy (NCOA) account for 41 percent of the survey sample.

Background Question A asked respondents to indicate the highest education level/status attained: and presented the following categories for their selection:

1. High School
2. High School + Some College
3. Associate's Degree
4. Bachelor's Degree
5. Bachelor's Degree + Some Graduate
6. Master's Degree
7. Master's Degree + Some Advanced
8. Doctoral Degree
9. Other (please indicate): _____

For purposes of this data analysis, these categories were further combined to represent five distinct degree-attained levels representing high school (Categories 1 & 2), associate's degree (Category 3), bachelor's degree (Categories 4 & 5), master's degree (Categories 6 & 7), and doctoral degree (Categories 8 & 9). The doctoral degree category also includes those surveys that indicated Medical Doctor and Juris Doctor degrees. Respondents showed that 18 percent of the sample had attained a high school degree, 14 percent had an associate's degree, 32 percent had achieved a bachelor's degree, 33 percent had a master's degree, and just 2 percent possessed a doctoral degree.

The current rank or grade of the survey respondents was derived from Background Question B, which asked participants to circle their corresponding grade from E-3 to O-6. Civilian participants were given grading based on the PME school they were attending (i.e., civilians attending SOS were given the grade/rank equivalent of O-3/Captain). Due to adjustments in the original survey methodology, personnel in the grades E-3 and E-4 were not surveyed. As would be expected, the grade/rank indicator corresponds very closely to the attended PME school (i.e. Majors attend ACSC, etc.). Table 18 lists the grade spectrum of survey participants.

Table 18. Survey Sample by Military Grade or Equivalent

Grade	Personnel	Percentage
E-5	22	1%
E-6	314	19%
E-7	44	3%
E-8	311	18%
O-3	588	35%
O-4	322	19%
O-5	66	4%
O-6	20	1%
TOTAL	1,687	100%

Background Question C responses show the service affiliation of the participants. As expected, 95 percent of respondents were United States Air Force (USAF) military personnel. The remaining participants were United States Army (USA), United States Navy (USN), and United States Marine Corps (USMC) military personnel; United States Federal Government (primarily Department of Defense) or Foreign military (International Officers (IOs)) personnel. Each of these non-USAF categories represent approximately 1 percent of the survey population.

Background Question D asked respondents to indicate the major command (MAJCOM) or equivalent organization they were currently assigned to or were most recently assigned to if they were AWC or ACSC students. Table 19 shows how survey participants were distributed amongst 18 MAJCOM or equivalent organizations throughout the USAF. Sister service, IOs, and non-USAF civilians were categorized as "others"; as were USAF military personnel assigned to non-listed organizations, including joint/tri-service organizations.

Table 19. Survey Sample by Major Command

Major Command	Personnel	Officers	Enlisted
Air Combat Command	439 (26%)	210 (21%)	229 (33%)
Air Mobility Command	235 (14%)	128 (13%)	107 (15%)
Air Education and Training Command	205 (12%)	134 (13%)	71 (10%)
Air Force Materiel Command	185 (11%)	134 (13%)	51 (07%)
Air Force Space Command	79 (05%)	58 (06%)	21 (03%)
Pacific Air Forces	76 (05%)	48 (05%)	28 (04%)
United States Air Forces Europe	61 (04%)	38 (04%)	23 (03%)
Air National Guard/Air Force Reserve	56 (03%)	13 (01%)	43 (06%)
Air Force Special Operations Command	48 (03%)	17 (02%)	31 (04%)
Air Intelligence Agency	45 (03%)	23 (02%)	22 (03%)
Air Force District of Washington	35 (02%)	29 (03%)	6 (01%)
Other	223 (13%)	164 (16%)	59 (09%)
TOTAL*	1,687 (100%)	996 (100%)	691 (100%)

* Some column percentages do not total to 100 percent due to rounding error.

The Primary Air Force Specialty Code (PAFSC) of survey respondents was requested in Background Question E. Each response was categorized during data entry into one of two possible specialty lists, one for officer and one for enlisted personnel. The officer specialty list consisted of 20 separate categories, while the enlisted specialties were divided into 15 different categories. In this context, it is important to note that 40 percent of the officer sample was categorized as rated (pilots and/or navigators) and that 28 percent of the enlisted respondents were aircraft maintenance or equivalent personnel. Tables 20 and 21 show officer and enlisted specialty descriptions and category sample populations.

Table 20. Survey Officer Specialties Represented

Officer Specialty	Personnel	Percentage
Pilot	314	32%
Navigator	83	08%
Air Traffic Cont/Weapon Dir	16	02%
Missile/Space Ops	52	05%
Operations Mgt	10	01%
Acquisition*	142	14%
Maintenance**	36	04%
Comm-Computer	62	06%
Civil Engineering	19	02%
Transportation/Supply	20	02%
Logistics	13	01%
Financial	9	01%
Information Mgt	18	02%
Personnel***	28	03%
Intelligence	38	04%
Security Police	16	02%
Health Professions	55	06%
Other	65	07%
TOTAL****	996	100%

* Includes Scientific, Acquisition, Engineering, and Contracting Career Field.
** Aircraft and Missile Maintenance, including Munitions.
*** Includes Personnel, Manpower, Education & Training.
**** Percentages do not total 100 percent due to rounding error.

Table 21. Survey Enlisted Specialties Represented

Enlisted Specialty*	Personnel	Percentage
Flight Engineer/Loadmaster	36	05%
Airfield Mgt/Air Traffic Control	35	05%
Intelligence	23	03%
Life Support/Weather	15	02%
Maintenance	196	28%
Comm-Computer	29	04%
Logistics/Missile Maint	12	02%
Supply/Vehicle Ops	85	12%
Information Mgt	28	04%
Construction/Fire Protection	56	08%
Security Police	67	10%
Health Professions	45	07%
Finance/Contracting	24	03%
Instructor/Recruiter	35	05%
Senior Enlisted Advisor	5	01%
TOTAL**	691	100%

* For purposes of this study, enlisted specialties were very broadly defined.
** Percentages do not total 100 percent due to rounding error.

Background Question F indicated the current PME school that the respondent was attending. Results for this category were previously identified as Table 17.

The commissioning source for officers was recorded by Background Question G. Respondents indicated "Not Applicable" if they were not commissioned officers (i.e., almost all enlisted respondents), Officer Training School (OTS)/Officer Candidate School (OCS), Reserve Officer Training Corps (ROTC), Service Academy, or "Other." The "Other" category was used most frequently by USAF military personnel in the health professions, many of whom were granted direct commissions. Some IOs indicated "Other", while others recorded "Not Applicable"; all civilian respondents answered "Not Applicable". Due to the large number of enlisted personnel participating in the survey, 42 percent of the survey population was not commissioned by any source. Of the remaining respondents, 22 percent were commissioned through OTS/OCS, 43 percent were ROTC,

26 percent were Service Academy, 8 percent indicated "Other", and 2 percent were "Not Applicable." Three enlisted respondents also indicated that they were commissioned by some source; further research indicated that they were previously commissioned officers, who during Reduction In Force (RIF) actions were offered and accepted NCO appointments.

Data Analysis by Question—Total Sample. The following section describes descriptive data results for each part of the instrument and is organized based on the basic structure of the survey. Part II of the instrument concerned specific TA questions related to familiarity and usage; and opinions concerning value, recruitment, retention, job satisfaction, and job performance. Additionally, questions concerning the non-existence of TA and the use of TA in different funding environments were included in the section. Survey Part III asked for general education program opinions on recruitment/retention, promotion, job performance, job satisfaction, and education value. Each of these question areas will be examined separately within this section.

Familiarity and Use of TA. The following TA description and two yes/no questions were asked to baseline respondent knowledge of and use of TA during their careers:

> Definition: The DoD Tuition Assistance program provides a percentage of tuition and fees for officer and enlisted personnel seeking undergraduate, graduate, and doctoral degrees in the off-duty environment. Current AF educational policy allows 75 percent funding for officers and between 75 - 90 percent for enlisted (depending on grade) up to a cap of $250 per semester hour. Note: Several specialized programs do exist which offer 100 percent funding.
>
> 1. Are you familiar with the tuition assistance program?
> 2. Have you used tuition assistance?

For the entire survey sample, 90 percent of respondents indicated they were familiar with TA and 68 percent of them had used it.

TA Program Opinions. For all remaining survey questions, participants were asked to indicate their opinion of referenced statements by agreeing or disagreeing along a Likert Scale of 1 to 5, where "1" was "Strongly Agree" and "5" was "Strongly Disagree." "Not Applicable" was indicated with a "6." The nine questions listed in Table 22 were used to gauge respondent opinions on the effectiveness of the TA program along various parameters (Note: To enhance the readability of all remaining tables, the standard format has been altered to exclude horizontal lines and improve text visibility):

Table 22. Tuition Assistance Opinion Questions

Survey Question	*Strongly Agree*	*Agree*	*Neutral*	*Disagree*	*Strongly Disagree*	*N/A*
The DoD tuition assistance program is...						
3. a valuable DoD education program.	73%	20%	04%	00%	01%	01%
4. a valuable recruiting tool for officers.	21%	23%	27%	08%	02%	18%
5. a valuable recruiting tool for enlisted.	53%	32%	09%	02%	01%	04%
6. improves the retention of quality officers.	15%	23%	29%	11%	04%	19%
7. improves the retention of quality enlisted.	33%	39%	18%	05%	01%	04%
8. improves officer job satisfaction.	15%	24%	29%	08%	03%	20%
9. improves enlisted job satisfaction.	28%	40%	22%	05%	01%	05%
10. improves officer job performance.	15%	23%	29%	10%	04%	20%
11. improves enlisted job performance.	28%	38%	22%	06%	02%	04%

Table 22 lists the descriptive statistics for each of these questions. Notable among them is that 93 percent of respondents either strongly agree (73 percent) or agree (20 percent) that TA is "a valuable DoD education program." Additionally, 88 percent of

participants felt that TA was "a valuable recruiting tool for enlisted", 72 percent believe TA "improves the retention of quality enlisted", and 68 percent indicated TA "improves enlisted job satisfaction." It is valuable to note that even though "officer-question" results were not as dramatic, significantly more respondents answered in agreement than in disagreement. These results seem to imply that TA is very important to all, but especially so for enlisted personnel.

Without the TA Program. The following three questions in Table 23 were asked to ascertain individual opinions on self-pursuit, officer-pursuit and enlisted-pursuit of advanced degrees for officers (master's degree higher) and degrees for enlisted (associate's degree higher):

Table 23. Without Tuition Assistance Opinion Questions

Survey Question	*Strongly Agree*	*Agree*	*Neutral*	*Disagree*	*Strongly Disagree*	*N/A*
Without the tuition assistance program...						
12. I would not pursue/have pursued an advanced degree.	23%	24%	14%	18%	12%	10%
13. Officers will not/would not pursue advanced degrees.	07%	20%	24%	17%	09%	23%
14. enlisted personnel will not/would not pursue degrees.	30%	36%	15%	10%	03%	06%

The Table 23 data generally show that roughly half (47 percent) of respondents strongly agree or agree with the statement that "without the TA program, I would not pursue/have pursued an advanced degree." Only 27 percent of respondents strongly agreed or agreed that "officers will not/would not pursue advanced degrees" without tuition assistance; but the same question for enlisted indicates 66 percent will not/would not pursue degrees. The data appears to show more impact for the enlisted force than the

officer force in a hypothesized non-TA environment; however, question 12 further shows a perceived significant threat to one's personal ability to obtain a degree without TA.

TA 10 Percent Reimbursement Reduction. Three questions were asked regarding individual opinions on self-pursuit, officer-pursuit and enlisted-pursuit of advanced degrees in a TA program environment where the TA reimbursement was reduced by 10 percent. These questions and response percentages are listed in Table 24:

Table 24. Tuition Assistance 10 Percent Reimbursement Reduction Opinion Questions

Survey Question	*Strongly Agree*	*Agree*	*Neutral*	*Disagree*	*Strongly Disagree*	*N/A*
If the tuition assistance program reduced the percentage of funding by 10% (ex. 75% to 65% reimbursement)...						
15. I would not pursue/have pursued an advanced degree.	12%	20%	20%	29%	12%	08%
16. officers will not/would not pursue advanced degrees.	05%	12%	27%	24%	09%	23%
17. enlisted personnel will not/would not pursue degrees.	20%	33%	21%	17%	03%	06%

Thirty-two percent of survey participants strongly agreed or agreed with the statement that "If the tuition assistance program reduced the percentage of funding by 10 percent (ex. 75 percent to 65 percent reimbursement), I would not pursue/have pursued an advanced degree;" while 41 percent strongly disagree or agree with the statement. Regarding the officer-oriented question, 17 percent of the sample strongly agreed or agreed that "officers will not/would not pursue advanced degrees" in a 10 percent reduction situation. Forty-three percent of respondents indicated strong agreement or agreement that "enlisted personnel will not/would not pursue advanced degrees" in a 10

percent reduction situation. Once again, perceived enlisted impact in this area may be considered more significant than officer impact. Personal feelings seem to support the assertion that a 10 percent reimbursement reduction would not have severe effect on TA participation and education experiences.

TA 25 Percent Reimbursement Reduction. Table 25 list the three questions concerning self-pursuit, officer-pursuit and enlisted-pursuit of advanced degrees in a TA program environment where the TA reimbursement was reduced by 25 percent:

Table 25. Tuition Assistance 25 Percent Reimbursement Reduction Opinion Questions

Survey Question	*Strongly Agree*	*Agree*	*Neutral*	*Disagree*	*Strongly Disagree*	*N/A*
If the tuition assistance program reduced the percentage of funding by 25% (ex. 75% to 50% reimbursement)...						
18. I would not pursue/have pursued an advanced degree.	25%	18%	16%	23%	10%	08%
19. officers will not / would not pursue advanced degrees.	14%	15%	25%	17%	07%	22%
20. enlisted personnel will not / would not pursue degrees.	37%	28%	16%	11%	03%	06%

Forty-three percent of survey participants strongly agreed or agreed with the statement that "If the tuition assistance program reduced the percentage of funding by 25 percent (ex. 75 percent to 50 percent reimbursement), I would not pursue / have pursued an advanced degree." Regarding the officer-oriented question, 29 percent of the sample strongly agreed or agreed that "officers will not/would not pursue advanced degrees" in a 25 percent reduction situation and 65 percent of respondents indicated strong agreement or agreement that "enlisted personnel will not would not pursue advanced degrees" in a 25

percent reduction situation. Clearly, respondents felt much more strongly about a 25 percent reduction than a 10 percent reduction in TA reimbursements. This is almost predictable due to the costs of higher education, but most participants seemed to believe that a 25 percent reduction would severely hamper enlisted off-duty education opportunities.

Recruitment and Retention Opinions. Part III of the instrument begins with six questions regarding education program impacts on recruitment and retention. As previously described, questions are grouped into self-assessment, officer-assessment and enlisted assessment areas. These questions and their percentage responses are listed in Table 26:

Table 26. Recruitment and Retention Opinion Questions

Survey Question	*Strongly Agree*	*Agree*	*Neutral*	*Disagree*	*Strongly Disagree*	*N/A*
A major reason I personally...						
21. joined the military was the educational opportunities/programs.	18%	26%	13%	23%	17%	02%
22. stayed in the military was the educational opportunities/programs.	14%	26%	15%	25%	18%	03%
A major reason officers...						
23. join the military is the educational opportunities/programs.	05%	17%	24%	21%	11%	22%
24. stay in the military is the educational opportunities/programs.	05%	15%	25%	21%	12%	22%
A major reason enlisted personnel...						
25. join the military is the educational opportunities/programs.	28%	47%	14%	05%	02%	05%
26. stay in the military is the educational opportunities/programs.	21%	44%	20%	08%	02%	05%

Of particular interest among the results for this section are the answers to the questions regarding educational impact on enlisted personnel joining and staying in the military. The sample either strongly agreed or agreed at a rate of 75 percent that "a major reason enlisted personnel join the military is the educational opportunities/programs." Additionally, 65 percent of survey respondents strongly agreed/agreed that "a major reason enlisted personnel stay in the military is the educational opportunities/programs." Personal and officer-related opinions seemed less significant, with officer recruitment/retention closely "leaning" toward negative replies. The enlisted-opinion data supports previously referenced Basic Military Training Survey data which maintains a very strong relationship between recruitment (and possibly retention) and available educational opportunities

Promotion Opinions. The following section of questions in Part III were developed to evaluate perceptions of educational degrees on the promotion systems for officers and enlisted.

Table 27. Promotion Opinion Questions

Survey Question	*Strongly Agree*	*Agree*	*Neutral*	*Disagree*	*Strongly Disagree*	*N/A*
Having an advanced degree...						
27. is a major factor in officer promotions.	43%	24%	10%	02%	01%	20%
28. should be a major factor in officer promotions.	15%	24%	18%	14%	10%	20%
Having a degree...						
29. is a major factor in enlisted promotions.	14%	36%	24%	16%	05%	05%
30. should be a major factor in enlisted promotions.	11%	28%	25%	21%	10%	05%
Educational data/information should be "masked" from...						
31. officer promotion boards.	10%	10%	18%	22%	20%	21%
32. enlisted promotion boards.	12%	15%	19%	25%	22%	06%
If educational data was "masked" from promotion boards, I would still...						
33. pursue/have pursued an advanced degree.	36%	43%	10%	05%	03%	03%
34. encourage others to pursue an advanced degree.	30%	48%	13%	04%	02%	02%

Table 27 lists promotion statement results. Among the significant pieces of data in this section are the respondents' strong agreement/agreement of 67 percent of the sample that "having an advanced degree is a major factor in officer promotions;" while only 3 percent of participants strongly disagreed/disagreed with this statement. Fifty percent of the respondents strongly agreed/agreed with the same statement applied toward enlisted personnel. Thirty-nine percent of respondents strongly agreed or agreed with both "having an advanced degree should be a major factor in officer promotions and with enlisted promotions." The questions pertaining to educational data/information being

"masked" from officer promotion boards and enlisted promotion boards yielded 42 percent and 47 percent strong disagreement/disagreement, respectively.

Respondents felt most strongly about the two questions concerning the pursuit of advanced degrees if educational data was "masked" from promotion boards. The statement "If educational data was 'masked' from promotion boards, I would still pursue/have pursued an advanced degree" was strongly agreed/agreed to by 79 percent of respondents and strongly disagreed/disagreed to by only 8 percent of subjects. Similarly, "If educational data was 'masked' from promotion boards, I would still encourage others to pursue an advanced degree" was strongly agreed/agreed to by 78 percent of respondents and strongly disagreed/disagreed to by only 6 percent of all participants. The impact of education on promotion and promotion opportunity is an extremely volatile issue. Advanced degrees for officers appear to be more important than degrees for enlisted, while "masking" educational data from promotion boards is not looked upon favorably. Respondents strongly support the contention that they would continue to educate themselves, even if it did not further their promotability.

Job Performance Opinions. The three job performance-related questions concern personal, officer and enlisted job performance with advanced degrees:

Table 28. Job Performance Opinion Questions

Survey Question	*Strongly Agree*	*Agree*	*Neutral*	*Disagree*	*Strongly Disagree*	*N/A*
35. Having or pursuing an advanced degree has increased my ability to do my job.	25%	33%	16%	12%	06%	08%
36. Officers with advanced degrees demonstrate better job performance than those who do not.	07%	17%	28%	18%	10%	19%
37. Enlisted with degrees demonstrate better job performance than those who do not.	14%	37%	24%	16%	05%	04%

On the personal level, "having or pursuing an advanced degree has increased my ability to do my job" yielded a 58 percent strong agreement/agreement rating. Generally though, respondents felt less strongly about "officers with advanced degrees demonstrate better job performance than those who do not," by only strongly agreeing or agreeing at a 24 percent rating. Applying the same statement to enlisted, elicited 51 percent of respondents strongly agreeing/agreeing. Job performance results are listed in Table 28. Of particular interest is the seemingly inconsistent feeling of respondents that "I perform better because of my degree, but nobody else (particularly officers) performs better because of their degrees."

Job Satisfaction Opinions. The three job satisfaction-related questions in Table 29 were asked regarding personal, officer and enlisted job satisfaction with advanced degrees:

Table 29. Job Satisfaction Opinion Questions

Survey Question	*Strongly Agree*	*Agree*	*Neutral*	*Disagree*	*Strongly Disagree*	*N/A*
38. Having or pursuing an advanced degree has increased my job satisfaction.	18%	28%	24%	15%	06%	09%
39. Officers having or pursuing advanced degrees have higher job satisfaction those who do not.	05%	16%	35%	14%	07%	22%
40. Enlisted having or pursuing degrees have higher job satisfaction than those who do not.	11%	30%	34%	15%	04%	05%

The only notable data from this section involves the 46 percent of survey participants who strongly agreed/agreed that "having or pursuing an advanced degree has increased my job satisfaction."

Education Value Opinions. The final nine questions of the survey pertain to educational "value" and its impact on a number of factors related to the pursuit of and inherent advantages/outcomes of an advanced education. The perceived value to the individual, as well as officers and enlisted is evaluated. Additionally, the impact of education on expressing ideas in writing and briefings, thinking critically, and comprehending managerial/leadership skills is reviewed:

Table 30. Education Value Opinion Questions

Survey Question	*Strongly Agree*	*Agree*	*Neutral*	*Disagree*	*Strongly Disagree*	*N/A*
41. Having or pursuing an advanced degree is valuable to me.	54%	35%	05%	03%	02%	03%
42. Having or pursuing an advanced degree has increased my level of confidence.	40%	32%	12%	06%	03%	08%
43. My having/pursuing an advanced degree is valuable to the military.	41%	35%	14%	05%	03%	03%
44. Officers having/pursuing advanced degrees are valuable to the military.	27%	32%	16%	04%	02%	19%
45. Enlisted having/pursuing degrees are valuable to the military.	38%	42%	12%	03%	01%	03%
46. Having/pursuing an advanced degree has helped me clearly express my ideas in writing.	27%	35%	17%	09%	04%	07%
47. Having/pursuing an advanced degree has helped me clearly express my ideas in briefings.	26%	33%	19%	11%	04%	07%
48. Having/pursuing an advanced degree has helped me think critically.	31%	36%	14%	07%	03%	08%
49. Having/pursuing an advanced degree has increased my comprehension of managerial/leadership techniques.	33%	34%	14%	07%	04%	07%

Value section statistics are shown in Table 30. Clearly, all of these results were strongly aligned with strongly agree/agree rankings. The range of positive responses range from 59 percent to 89 percent. The shear magnitude of the positive statements on these questions and the utter lack of negative responses, speaks volumes to just how much the respondents think education is important. Clearly, most participants believe that the advanced degrees they have attained and are attaining have bettered their personal self-confidence, writing and briefing skills, critical thinking, and managerial/leadership

practices. In addition, the assessment of the subjective interpretation of "value" indicates that people feel it is important.

Analysis of Selected Comparisons. This section describes data analysis comparisons for selected categories. Category comparisons were selected based on perceived interest levels of the end item users; however, the data is available for other comparisons too numerous to include in this final report. It is important to note the assumption that rank/grade and PME school are considered equivalent values in that rank and attendance at selected PME schools are so closely correlated (i.e. Majors attend ACSC and Senior Master Sergeants attend SNCOA). In the following subsections the relationships between answers derived from separate sample subgroups will be explored by simply identifying and discussing significant differences in how each group answered instrument questions. Tables in each section show the referenced questions, averaged Likert scale answers, and the differences between each subgroup's averages.

For the averaged Likert scale numbers, lower numbers indicate more relative agreement to the statements than higher numbers; values were computed using simple average. Where appropriate, possible explanations for discrepancies/differences have been given to stimulate discussion and resolve problems. All shown sample differences were calculated and verified for statistical significance via a simple t-test to determine equality or inequality of each subgroup's mean answer on the referenced questions. The t-test assumed unequal variances and a confidence level of .05.

Officer Versus Enlisted. The most obvious comparison among the variety of background questions used in the instrument is the simple comparison of officers and

enlisted. The eight questions selected and displayed in Table 31 represent the most significant portions of data in the officer/enlisted comparison:

Table 31. Officer Versus Enlisted

Survey Question	*Officers (n=996)*	*Enlisted (n=691)*	*Difference*
8. The DoD tuition assistance program improves officer job satisfaction.	2.33	2.76	0.43
10. The DoD tuition assistance program improves officer job performance.	2.41	2.83	0.41
15. If the tuition assistance program reduced the percentage of funding by 10% (ex. 75% to 65% reimbursement), I would not pursue / have pursued an advanced degree.	3.49	2.66	0.82
18. If the tuition assistance program reduced the percentage of funding by 25% (ex. 75% to 50% reimbursement), I would not pursue / have pursued an advanced degree.	3.19	2.23	0.96
21. A major reason I personally joined the military was the educational opportunities/programs.	3.10	2.45	0.64
22. A major reason I personally stayed in the military was the educational opportunities/programs.	3.25	2.54	0.71
27. Having an advanced degree is a major factor in officer promotions.	1.53	2.11	0.58
44. Officers having/pursuing advanced degrees are valuable to the military.	1.80	2.26	0.46

The differences in questions 8 and 10 simply indicate that officers feel more strongly (agreement) about TA improvement impacts on officer job performance and officer job satisfaction than enlisted personnel. Questions 15 and 18 demonstrate significantly that enlisted personnel would feel more impact from reductions in TA reimbursements than

officers. This may be considered obvious, given the pay differential between the two subgroups. Enlisted personnel also indicate they joined and stayed in the military for educational reasons to a much larger extent than the officer corps. Once again, the differences in questions 27 and 44 are primarily accountable to the fact that officers feel more strongly about officer issues than enlisted.

One might wonder why officers did not seem to feel less strongly about enlisted issues in a similar fashion to several of the above questions. A plausible explanation might be found in the willingness of the officer corps, as the military leadership, to make decisions regarding enlisted issues; and conversely, the unwillingness of the enlisted force to do the same for officers. In fact, survey participation statistics clearly show that many more enlisted personnel "abstained" from answering officer-oriented questions (even though there was no explicit or implied direction to NOT answer them), than officers "abstaining" from enlisted questions.

Rated Officer Versus Non-Rated Officer. Another obvious comparison for USAF officers and their peers is to explore any differences between rated (pilots and navigators) and non-rated (everybody else) personnel. Table 32 shows the most significant differences among survey questions:

Table 32. Rated Officers Versus Non-Rated Officers

Survey Question	*Rated (n=397)*	*Non-Rated (n=599)*	*Difference*
21. A major reason I personally joined the military was the educational opportunities/programs.	3.60	3.10	0.50
22. A major reason I personally stayed in the military was the educational opportunities/programs.	3.75	3.25	0.50
28. Having an advanced degree should be a major factor in officer promotions.	3.37	2.60	0.77
31. Educational data/information should be "masked" from officer promotion boards.	2.93	3.68	0.75
35. Having or pursuing an advanced degree has increased my ability to do my job.	2.92	2.17	0.75
36. Officers with advanced degrees demonstrate better job performance than those who do not.	3.44	2.89	0.55
38. Having or pursuing an advanced degree has increased my job satisfaction.	3.09	2.50	0.59
39. Officers having or pursuing advanced degrees have higher job satisfaction those who do not.	3.34	2.83	0.52
48. Having/pursuing an advanced degree has helped me think critically.	2.45	1.92	0.53

Although both rated and non-rated officers fall on the disagreement side of the Likert scale for recruitment and retention questions 21 and 22, rated personnel "disagree" more. This might be explained by the "often-heard" rationale of joining the Air Force "to fly." Those who cannot/do not fly feel less strongly about it. The rated respondents also disagreed more severely with advanced degrees being major factors in promotion

(question 28). The training and deployment demands of many rated personnel make it particularly difficult for them to acquire a part-time advanced degree in the early years of their career. Combine this with competition at promotion boards with non-rated officers who have advanced degrees and it may explain their subgroup's feeling on whether education "should be" a major factor in promotions. Similarly, the strong non-rated opinion on not masking education data from promotion boards (question 31) may simply mean that they do not want to give away a perceived advantage or possible "equalizer".

Questions 35, 36, 38, and 39 regarding job performance and job satisfaction clearly show that the rated respondents felt more negatively about advanced degree impacts on these areas. Performance and satisfaction involving flying Versus office environment work might help explain these discrepancies. Finally, question 45's "think critically" statement is agreed to by an overwhelming majority, but more strongly by the non-rated community.

Field Grade Officer (FGO) Versus Company Grade Office (CGO). FGOs and CGOs might be expected to be significantly different in many areas due to the age and experience differences between the groups; however only the four questions listed in Table 33 were significant:

Table 33. Field Grade Officers Versus Company Grade Officers

Survey Question	*Field Grade (n=408)*	*Company Grade (n=588)*	*Difference*
15. If the tuition assistance program reduced the percentage of funding by 10% (ex. 75% to 65% reimbursement), I would not pursue / have pursued an advanced degree.	3.68	3.26	0.42
16. If the tuition assistance program reduced the percentage of funding by 10% (ex. 75% to 65% reimbursement), officers will not / would not pursue advanced degrees.	3.58	3.18	0.41
18. If the tuition assistance program reduced the percentage of funding by 25% (ex. 75% to 50% reimbursement), I would not pursue / have pursued an advanced degree.	3.40	2.87	0.53
19. If the tuition assistance program reduced the percentage of funding by 25% (ex. 75% to 50% reimbursement), officers will not / would not pursue advanced degrees.	3.16	2.71	0.45

All four questions in this section involve reactions to decreases in TA reimbursements. Field grade officers more strongly disagree to the statements that reductions would prevent themselves personally and officers in general from pursuing advanced degrees. As most of the FGOs in the survey sample already have advanced degrees, it seems plausible that their answers here do not necessarily represent realistic portrayals of how they would feel if they did not already have the advanced degrees.

SNCOA Versus NCOA (Senior Enlisted Versus Mid-Level Enlisted). Senior and Mid-Level NCOs could be expected to feel differently about some education factors:

Table 34. Senior NCOs Versus Mid-Grade NCOs

Survey Question	*Senior NCOs (n=355)*	*Mid-Lvl NCOs (n=336)*	*Difference*
15. If the tuition assistance program reduced the percentage of funding by 10% (ex. 75% to 65% reimbursement), I would not pursue / have pursued an advanced degree.	2.91	2.40	0.51
18. If the tuition assistance program reduced the percentage of funding by 25% (ex. 75% to 50% reimbursement), I would not pursue / have pursued an advanced degree.	2.52	1.92	0.61
20. If the tuition assistance program reduced the percentage of funding by 25% (ex. 75% to 50% reimbursement), enlisted personnel will not/would not pursue advanced degrees.	2.40	1.89	0.51
32. Educational data/information should be "masked" from enlisted promotion boards.	3.52	3.02	0.50

Table 34 lists the major differences found between SNCOA and NCOA student samples. As with the comparison between senior and junior officers, the major differences between senior and mid-level NCOs is with opinions on pursuit of degrees in a diminished TA environment. Questions 15, 18 and 20 all clearly indicate that senior enlisted personnel disagree more strongly than mid-level NCOs with how less reimbursement will curb their pursuit of degrees and overall enlisted pursuit of degrees. The same phenomenon may be present here as was present with senior officers. Senior NCOs also do not support "masking" education data at a more significant rate than mid-level NCOs.

Personnel Who Have Used TA Versus Personnel Who Have Not Used TA.

The effect of using the TA program on one's opinions about it and general education

programs may point out basic tenets of how well the program is perceived throughout the services. Table 35 offers the three questions demonstrating the largest discrepancies between users and non-users of TA:

Table 35. Personnel Who Have Used TA Versus Personnel Who Have Not Used TA

Survey Question	*Used TA (n=1149)*	*Not Used TA (n=538)*	*Difference*
21. A major reason I personally joined the military was the educational opportunities/programs.	2.76	3.36	0.60
22. A major reason I personally stayed in the military was the educational opportunities/programs.	2.91	3.44	0.54
32. Educational data/information should be "masked" from enlisted promotion boards.	3.45	3.05	0.40

Clearly, individuals who have used TA initially joined and then stayed in the military for educational opportunities to a greater extent than those who have not used TA. This passes the logic test as it appears to imply that those who joined the military with educational benefits in mind are using them. One almost obvious response is the fact that those who have used TA disagree more strongly with "masking" education data for promotion more than those who have not availed themselves of TA and advanced education opportunities.

Officers With Master s Degree Versus Officers Without Master s Degrees. A final comparison area concerns evaluating the differences between officers with advanced degrees (master's degrees and higher) and officers without advanced degrees. Table 36 lists five survey questions that showed the largest degree of difference:

Table 36. Officers With Master s Degrees Versus Officers Without Master s Degree

Survey Question	*With Masters (n=569)*	*Without Masters (n=427)*	*Difference*
28. Having an advanced degree should be a major factor in officer promotions.	2.58	3.34	0.77
31. Educational data/information should be "masked" from officer promotion boards.	3.80	2.84	0.97
32. Educational data/information should be "masked" from enlisted promotion boards.	3.62	2.98	0.64
35. Having or pursuing an advanced degree has increased my ability to do my job.	2.19	2.87	0.68
36. Officers with advanced degrees demonstrate better job performance than those who do not.	2.86	3.44	0.57

It should come as no surprise that officers with master's degrees agree with advanced degrees being major factors in officer promotions significantly more than those who do not have advanced degrees (question 28). Additionally, those with the higher-level degrees disagree more strongly concerning "masking" educational data for officer and enlisted promotions (questions 31 and 32). And finally, Question 35 and 36's assessments indicate that having a master's degree positively influences the opinion of one's personal job performance and officer performance more than not having a degree.

Survey Summary. Although more detail will be provided in Chapter 5, Findings and Recommendations, it seems clear that there are definite outcomes of this survey research that should not go unnoticed by the academic and educational policy communities of the US Armed Forces. Firstly, the survey indicates that virtually everyone believes TA and other educational programs are extremely valuable to the services from many aspects.

Educational opportunities, like TA, are perceived to be recruiting "force multipliers" and contribute greatly to enhancing the quality of the force. Most survey respondents were familiar with TA, but it is still bothersome that one-in-ten of the respondents (officers and enlisted) were unfamiliar with such a far-reaching, popular program. In addition to the positive opinions listed above, TA may also improve job satisfaction and job performance, particularly in the enlisted force. If faced with funding cuts, it appears that enlisted personnel would suffer the most under decreased reimbursement levels for TA, although officers would be negatively impacted as well.

The perceived impacts of education on promotion render the situation of most personnel believing education to be a major factor in getting promoted; but split, depending on subgroup as to whether it should be a major factor. All aspects considered, most respondents felt that education data should not be "masked" from promotion boards, even though they claim they would still pursue degrees even if it were "masked." Job performance and job satisfaction outcomes of education are more difficult to quantify, but personnel do believe that there are improvements in their personal qualities based on education.

The value of education is difficult to define, but clearly survey respondents believe it exists. The massive agreement by all parties to the advantages/outcomes of education on verbal and written skills, as well as critical thinking and leadership is testament to the fact that people think it is important and wish to continue it's availability.

CHAPTER 5

Findings and Conclusions

This study sought first and foremost to demonstrate the comprehensive "value" of education to the Air Force. The results and findings clearly indicate the concept of educational value is difficult to quantify, and that the difficulty of this challenge also applies to civilian industry. Given these circumstances, the researchers sought to demonstrate qualitatively the value of education.

There are a number of educational outcomes which strongly indicate the value of education to the individual, the Air Force and the larger society. These outcomes are based upon the existing body of literature, this study's content analysis and survey results. More highly educated individuals have improved critical thinking ability. They tend to demonstrate greater clarity in writing and are more accomplished briefers. In addition, they gain substantive knowledge from their academic programs which may be directly applicable to their work environment. For instance, those possessing a master's degree in management can most likely articulate the latest management techniques, apply current human resources theory, and approach problem-solving in a more logical, scientific manner. These are merely a few of the valuable individual outcomes of education. They were supported directly or implicitly in Daedalus job advertisements, verified by published research or revealed by the survey. With respect to the organization; education tends to improve open-mindedness, nonauthoritarianism and diversity. These are critical traits members should possess if an organization is to prevent stagnation.

Aside from direct outcomes of education one derives from active participation, there are benefits the Air Force accrues by offering a robust educational program. Consistently, studies suggest that a primary reason young recruits enter the Air Force is the hope of furthering their educational stature. The survey conducted supports these earlier studies. In addition, these benefits are an important factor in personnel retention as well. AFPD 36-23 indicates that one of the objectives of voluntary educational opportunities is to "serve as a recruiting and retention incentive."[157] Review of literature and analysis of the research team's survey results indicates the objective is being met. Any modifications of existing programs and benefits should carefully consider the possible ramifications on recruitment and retention before acting; particularly among the enlisted force.

Although this research tends to support the general concept of acquiring higher education, suggesting when it should take place in an officer's or enlisted member's career remains a formidable task. However, in the area of the officer corps, some generalizations may be made from this study. Based on the job advertisements in the content analysis, one is more likely to come across jobs which either express or imply that an advanced degree is desirable among the field grade than the company grade advertisements. In addition, the promotion statistics suggests that officers currently tend to complete their advanced degrees around the time they make the rank of major. The survey instrument suggests that there is a strong perception among the corps that having an advanced degree is a major factor in officer promotions. To continue this train of logic, field grade level is around the time that officers are expected to become less a specialist and more of a generalist. A policy by senior leaders which would support these current perceptions may

help and encourage officers to "generalize" by furthering their education and broadening their perspectives.

The overarching study recommendation is to suggest that Air Force senior leaders actively support off-duty voluntary education programs—by ensuring the Air Force members learn of their benefits and by making funding of education programs, like tuition assistance, a priority. In terms of relative costs, it seems a small price to pay for a program that provides a great number of benefits. First, it is perceived as a valuable benefit by the vast majority of Air Force people, from the basic trainee to the future leadership at Air War College. Secondly, it provides important outcomes for the individual, such as advances in critical thinking, gains in communicative skills, and knowledge of contemporary leadership and management concepts. To meet the challenge of the post cold war, airmen must develop capability for fundamental original thought and pursue forward thinking. In this environment, higher levels of responsibility in both officer and enlisted corps, require generalist vision as well as technical and managerial expertise. Colonel John Warden refers to this as architectural rather than bricklayer thinking. "Prosecuting war requires top-down thinking—thinking from the big picture to the small—rather than the bottom up thinking."[158] Finally, the Air Force and society share in the benefits garnered by enlisted members who tend to be more satisfied and perhaps better emotionally adjusted than their lesser-educated contemporaries.

There have been other studies that have concentrated on individual components of military education (i.e., PME, GI Bill, TA, etc.). This study, however, addressed only off-duty voluntary education. Future studies might explore the interaction of all educational

opportunities/programs and the overall patterns of professional development in each career field.

Additionally, future studies in this field might further explore the link between education level and promotion. More work is needed to measure the impact of an advanced degree. In addition, further work might explore the motivations behind officers' and enlisted members' participation in the off-duty education programs. A greater understanding of their motivations might enable policy makers to predict possible outcomes of modifications to existing programs.

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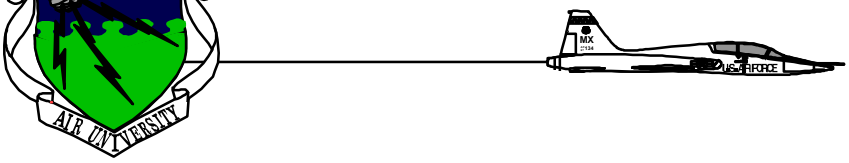
APPENDIX A

Project Briefings

Air Force Graduate and Undergraduate Education Programs: Need, Structure, & Focus

Research Project: 95-067F



OVERVIEW

- Research Background
- Education & Promotion in the Air Force
- Military & Civilian Education Review
- Value of Education
- Job Advertisement Content Analysis
- Education & Tuition Assistance Survey
- Summary

Research Background
- The Team -

Research Advisors

Dr. Glen Spivey

Col Ben Findley (IMA)

ACSC Students

Maj Ed Bolton

Maj Bill Mosley

Lt Col Lawrence Mwambola

Maj Jeff Renehan

Maj John Thompson

Maj Jack Weinstein

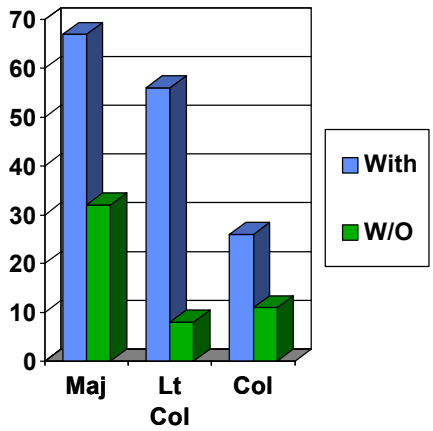
Research Background
- The Task -

- Explore broad facets of the off-duty, voluntary education program to include:
- Value to Air Force and individual
- Cost versus return on investment
- Timeliness and relationship to progression
- Quality of life and morale issues
- Tuition assistance

Timeline

Phase I	
Finalize charter	**22 Aug 94**
Research group established	**23 Sep 94**
Phase II	
Research team orientation	**5 Oct 94**
Research outline due	**28 Oct 94**
Interim Report to AU/XO	**25 Jan 95**
Status Report to AU/CC	**3 Feb 95**
Phase III	
Review research (AU/XO, AU/CC)	**Mar - May 95**
AETC/CC Update	**27 Mar 95**
AU Board of Visitors Brief	**10 Apr 95**
Education Working Group Update	***21 Apr 95***
Phase IV. Recommendations to AETC/CC	**May 95**
Final ACSC Research Product	**1 May 95**
Phase V. AETC/CC forwards recommendations	**TBD**

Education & Promotion in the USAF



- Promotion rates to Maj, Lt Col, Col
- Chart shows pilot rates -- "Promotes"
- Similar results for other fields
- Correlation only

Military Education Review

- Reviewed education levels for officers and enlisted personnel
  -- USAF, Army, Navy, Marines & Coast Guard
- Air Force
  -- More educated
  -- Gets degrees earlier
- Reviewed recent studies: TA and education benefits are key recruitment/retention tools

Civilian Education Review

- U.S. Chamber of Commerce Study
- Interviewed Fortune 500 Companies
- Questions Included
  – Opportunities, Programs, Cost, Payback, Recruiting
- General Consensus -- Difficult to quantify; seem to take value as given

Value of Education

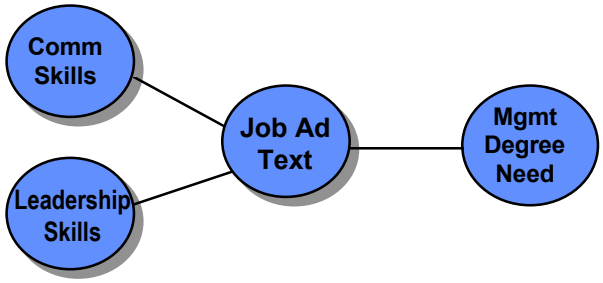
- AF's Return On Investment - Education
  - Cost-Benefit Analysis Inappropriate
- Fingers of Evidence
  - Education Literature - Reviewed
  - Perceptions of Leaders - Survey
  - Job Requirements - Content Analysis

Content Analysis

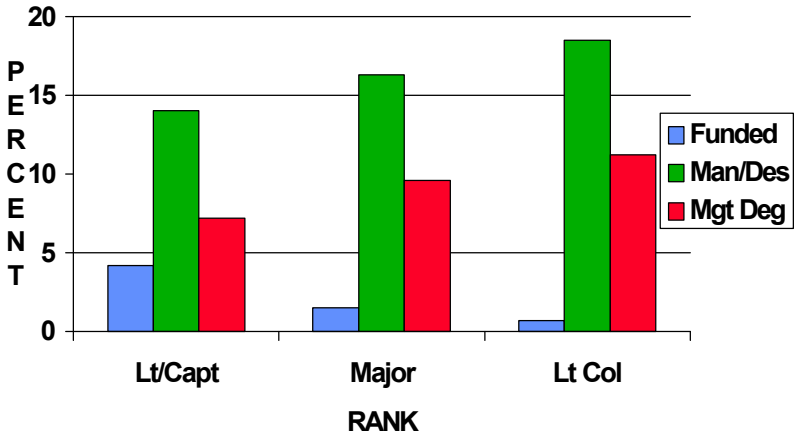
- Are there stated needs for advanced degrees in the officer corps?
  - Aside from funded requirements
- Are there implied needs for advanced management-related degrees?

Content Analysis

- Officer Assignment System - Daedalus
- Over 3,200 job advertisements
- Need for Grad degree/Management degree
- Constructed codebook



Mission Support Job Ads (n=2096)



AF Tuition Assistance and Off-Duty Education Survey

- Goal: Establish an "opinion-oriented" baseline on tuition assistance and "generic" AF education programs
- Sample: AF's Future Leadership
  - Air War College
  - Air Command and Staff College
  - Squadron Officer School
  - Senior NCO Academy
  - NCO Academy

AF Tuition Assistance and Off-Duty Education Survey

- Format: 50 Questions / Likert Scale
- Part I: Background Information
- Part II: Tuition Assistance
- Part III: Education Program Opinion
  - Recruitment / Retention
  - Promotion
  - Job Performance / Job Satisfaction
  - Value

Survey Population

School	Distro	Returns	%
AWC	250	83	33%
ACSC	570	328	58%
SOS	650	585	90%
SNCOA	360	352	98%
NCOA	460	339	73%
TOTAL	2,290	1,687	74%

Background Information

- Highest Education Level Attained
- Current Grade
- Service
- Major Command
- Primary Air Force Specialty
- PME School
- Commissioning Source

Background Information (Cont.)

- Education Level:

High School	18%
Associate's Degree	14%
Bachelor's Degree	32%
Master's Degree	33%
Doctorate / Other	2%

- By Grade:

E-5	1%	O-3	35%
E-6	19%	O-4	19%
E-7	3%	O-5	4%
E-8	18%	O-6	1%

Background Information (Cont.)

- Service:
  - 95% USAF (Other Services, Civilians, IOs)
- Major Command:

ACC	26%
AMC	14%
AETC	12%
AFMC	11%
ALL OTHERS	< 5%

Background Information (Cont.)

- Officers
  - Total = 996
  - Rated = 40%
  - Commissioning Source:

ROTC	= 42%	OTS/OCS	= 22%
Academy	= 26%	Other	= 10%

- Enlisted
  - Total = 691
  - Aircraft Maintenance = 28%
- Broad Spectrum of All Other Career Fields

Tuition Assistance

- Familiar with the TA program?
- Used TA?
  - Recruiting / Retention
  - Job Satisfaction / Job Performance
- Without TA...pursue degree?
  - Self / Enlisted / Officers
- 10% and 25% TA reimbursement reductions
  - Self / Enlisted / Officers

Tuition Assistance (Cont.)

- Familiar with the TA Program:

Officers	Enlisted	Total
89%	92%	90%

- Used TA:

Officers	Enlisted	Total
62%	76%	68%

Tuition Assistance (Cont.)

~ Strongly Agree / Agree ~

Question	Off	Enl	Tot
Valuable DoD Education Program:	**94%**	**94%**	**94%**
Valuable Recruiting Tool for Officers:	**59%**	**44%**	**55%**
Valuable Recruiting Tool for Enlisted:	**88%**	**89%**	**88%**
Improves Officer Retention:	**53%**	**32%**	**47%**
Improves Enlisted Retention:	**73%**	**78%**	**75%**
Improves Officer Job Satisfaction:	**57%**	**28%**	**49%**
Improves Enlisted Job Satisfaction:	**67%**	**76%**	**71%**
Improves Officer Job Performance:	**54%**	**28%**	**46%**
Improves Enlisted Job Performance:	**65%**	**73%**	**68%**

Tuition Assistance (Cont.)

~ Strongly Agree / Agree ~

Question	Off	Enl	Tot
Without the TA program, I would not pursue / have pursued an advanced degree:	**39%**	**69%**	**52%**
If the TA program reduced the percentage of reimbursement by 10% I would not pursue / have pursued an advanced degree:	**24%**	**48%**	**35%**
If the TA program reduced the percentage of reimbursement by 25%...:	**35%**	**65%**	**47%**

Education Program Opinion

- Recruitment / Retention
- Promotion
  - Is and Should Be a Major Factor?
  - "Masking" Education Data from Promotion Boards
- Job Performance
- Job Satisfaction
- Value
  - Confidence Level, Writing/Briefing, Leadership...

Education Programs (Cont.)

~ Strongly Agree / Agree ~

Question	Off	Enl	Tot
A major reason I personally joined the military was the educational opportunities / programs:	**35%**	**60%**	**46%**
A major reason I personally stayed in the military was the educational opportunities / programs:	**30%**	**56%**	**41%**

Education Programs (Cont.)

~ Strongly Agree / Agree ~

Question	Off	Rated	NR
Having an advanced degree is a major factor in officer promotions:	**92%**	**93%**	**91%**
Having an advanced degree should be a major factor in officer promotions:	**47%**	**33%**	**56%**
Educational data / information should be masked from officer promotion boards:	**29%**	**42%**	**20%**

Education Programs (Cont.)

~ Strongly Agree / Agree ~

Question	Off	Enl
Having a degree is a major factor in enlisted promotions:	**49%**	**57%**
Having a degree should be a major factor in enlisted promotions:	**35%**	**49%**
Educational data / information should be masked from enlisted promotion boards:	**27%**	**32%**

Additional Information

- Data Analysis
  - "Slice It and Dice It" Any Way You Want It
- Additional Surveys to AF-Wide Sample
  - 1000 Surveys Mailed
  - Expect Similar Results
    - » Field Grade PME Non-Selects
    - » Junior Officer & Enlisted
  - Responses Due 1 May 95
  - Data Annex to Final Report

Findings

- Tuition Assistance Reimbursement Rates
  - Officers vs. Enlisted
  - Junior vs. Senior
- Promotion Board "Masking"
  - Rated vs. Non-Rated
- Advanced Degree Applicability
- Value of Education

Summary

- Compendium of Current Research
  - Services & Industry
- Body of Knowledge Contributions
  - Daedalus Content Analysis
  - AF TA and Off-Duty Education Survey
- Final Report Due 1 May 95
  - Distribution to All Working Group Members

APPENDIX B

Content Analysis Codebook

CODEBOOK: CONTENT ANALYSIS OF DAEDALUS JOB ADS

(***recording units in bold)***

A. Communication Skills (CS) **(comm skills, communication skills)** ***Score under 1 & 2***

1 = Briefing **(brief, briefing, articulate, speak, speaking)**
2 = Writing **(write, writing)**

B. Leadership Skills (LS)

1 = Functions of Management **(manage, manager, planning, organizing, controlling, delegating, direct, directing)**
2 = Supervising **(supervise, supervising, lead, command)** **people only*

C. Degree Desired/Mandatory (DD) **(degree)** ***Circle any funded requirements***

1 = Arts **(Arts)**
2 = Business **(business administration, MBA, banking, finance, accounting,)**
3 = Education **(education admin, education degree, research degree, curriculum degree)**
4 = English **(English)**
5 = Engineering **(chemical, civil, electrical, electronics, industrial, materials, mechanical)**
6 = Humanities **(literature, history, foreign language, philosophy)**
7 = Natural Sciences **(biology, computer/info science, geology, chemistry, physics, astronomy, mathematics,)**
8 = Social Sciences **(sociology, economics, psychology, political science, public admin)**
9 = Any Advanced **(any master s, master, MA, MS)**

D. Advanced Management-related Degree Useful—*(Assign score of 1 each for A1, A2; assign score of 2 for B1, B2. If total score for ad is 3 or greater, check this block.)*

APPENDIX C

Air Force Tuition Assistance and Off-Duty Education Survey
AU SCN 95-03

PME Student -

This survey has been developed by an Air Command and Staff College research team sponsored and directed by AU/CC to quantify the opinions of future military leaders on tuition assistance and off-duty education programs.

Background

One of the Air Force's most important officer and enlisted recruiting tools is the promise of educational opportunities and programs. Unfortunately, recent funding shortages and the continuing military drawdown now jeopardize some of these programs. It is therefore essential to evaluate the perceived impact of changes in these programs on a number of personnel factors, including recruitment, retention, job performance and job satisfaction. This survey has been developed in order to measure the opinions of PME students relative to tuition assistance and off-duty education, as well as their general feelings regarding use of education data for promotion and the "value of education."

Instructions

Completing the survey should take approximately 10 minutes. Please complete the survey and return it to your survey administrator ASAP. Follow the specific instructions for each survey section. Complete the survey regardless of your service affiliation, country or military/civilian status. Questions regarding the survey should be directed to Major John Thompson, ACSC/Seminar #5, DSN 493-6794 or commercial (334) 953-6794. Thank you in advance for your support of this important initiative. Results of the survey will be forwarded to your school when analysis is complete.

PART I - BACKGROUND

Please indicate by circling or writing your appropriate responses to the following background questions:

A. Highest Educational Level/Status Attained:

1. High School
2. High School + Some College
3. Associate's Degree
4. Bachelor's Degree
5. Bachelor's Degree + Some Graduate
6. Master's Degree
7. Master's Degree + Some Advanced
8. Doctoral Degree
9. Other (please indicate): _____

B. Current Grade:

Enlisted:	E-3	E-4	E-5	E-6	E-7	E-8
Officer:	O-3	O-4	O-5	O-6		

C. Service:

USAF USA USN USMC Other_____

D. Major Command or equivalent (please indicate): _____
(If you are an ACSC or AWC student indicate the last MAJCOM you were assigned to)

E. Primary Air Force Specialty (AFSC) or equivalent: _____
(Please indicate general career field title (i.e., F-15E Pilot, Intel, Acquisition, etc.))

F. Current PME Student Status:

1. Airman Leadership School
2. NCO Academy
3. Senior NCO Academy
4. Squadron Officer School
5. Air Command and Staff College
6. Air War College

G. Commissioning Source:

1. Not Applicable
2. OTS / OCS
3. ROTC
4. Academy
5. Other (please indicate): _____

PART II - TUITION ASSISTANCE

Definition: The DoD Tuition Assistance program provides a percentage of tuition and fees for officer and enlisted personnel seeking undergraduate, graduate, and doctoral degrees in the off-duty environment. Current AF educational policy allows 75% funding for officers and between 75 - 90% for enlisted (depending on grade) up to a cap of $250 per semester hour. Note: Several specialized programs do exist which offer 100% funding.

1. Are you familiar with the tuition assistance program? YES NO

2. Have you used tuition assistance? YES NO

For all remaining survey questions, please indicate your opinion by circling your answer according to the following rating scale:

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Not Applicable
1	**2**	**3**	**4**	**5**	**6**

The DoD tuition assistance program is...	**Rating**					
3. a valuable DoD education program.	**1**	**2**	**3**	**4**	**5**	**6**
4. a valuable recruiting tool for officers.	**1**	**2**	**3**	**4**	**5**	**6**
5. a valuable recruiting tool for enlisted.	**1**	**2**	**3**	**4**	**5**	**6**
6. improves the retention of quality officers.	**1**	**2**	**3**	**4**	**5**	**6**
7. improves the retention of quality enlisted.	**1**	**2**	**3**	**4**	**5**	**6**
8. improves officer job satisfaction.	**1**	**2**	**3**	**4**	**5**	**6**
9. improves enlisted job satisfaction.	**1**	**2**	**3**	**4**	**5**	**6**
10. improves officer job performance.	**1**	**2**	**3**	**4**	**5**	**6**
11. improves enlisted job performance.	**1**	**2**	**3**	**4**	**5**	**6**
Without the tuition assistance program...						
12. I would not pursue / have pursued an advanced degree.	**1**	**2**	**3**	**4**	**5**	**6**
13. officers will not / would not pursue advanced degrees.	**1**	**2**	**3**	**4**	**5**	**6**
14. enlisted personnel will not / would not pursue degrees.	**1**	**2**	**3**	**4**	**5**	**6**

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Not Applicable
1	2	3	4	5	6

If the tuition assistance program reduced the percentage of funding by 10% (ex. 75% to 65% reimbursement)...

15. I would not pursue / have pursued an advanced degree. **1 2 3 4 5 6**

16. officers will not / would not pursue advanced degrees. **1 2 3 4 5 6**

17. enlisted personnel will not / would not pursue degrees. **1 2 3 4 5 6**

If the tuition assistance program reduced the percentage of funding by 25% (ex. 75% to 50% reimbursement)...

18. I would not pursue / have pursued an advanced degree. **1 2 3 4 5 6**

19. officers will not / would not pursue advanced degrees. **1 2 3 4 5 6**

20. enlisted personnel will not / would not pursue degrees. **1 2 3 4 5 6**

PART III - EDUCATION PROGRAM OPINION

RECRUITMENT

A major reason I personally...

21. **joined** the military was the educational opportunities/programs. **1 2 3 4 5 6**

22. **stayed** in the military was the educational opportunities/programs. **1 2 3 4 5 6**

A major reason officers...

23. **join** the military is the educational opportunities/programs. **1 2 3 4 5 6**

24. **stay** in the military is the educational opportunities/programs. **1 2 3 4 5 6**

A major reason enlisted personnel...

25. **join** the military is the educational opportunities/programs. **1 2 3 4 5 6**

26. **stay** in the military is the educational opportunities/programs. **1 2 3 4 5 6**

PROMOTION

Having an advanced degree...

27. **is** a major factor in officer promotions. **1 2 3 4 5 6**

28. **should be** a major factor in officer promotions. **1 2 3 4 5 6**

Having a degree...

29. **is** a major factor in enlisted promotions. **1 2 3 4 5 6**

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Not Applicable
1	2	3	4	5	6

30. **should be** a major factor in enlisted promotions. **1 2 3 4 5 6**

Educational data / information should be masked from...

31. officer promotion boards. **1 2 3 4 5 6**

32. enlisted promotion boards. **1 2 3 4 5 6**

If educational data was masked from promotion boards, I would still...

33. pursue / have pursued an advanced degree. **1 2 3 4 5 6**

34. encourage others to pursue an advanced degree. **1 2 3 4 5 6**

JOB PERFORMANCE

35. Having or pursuing an advanced degree has increased my ability to do my job. **1 2 3 4 5 6**

36. Officers with advanced degrees demonstrate better job performance than those who do not. **1 2 3 4 5 6**

37. Enlisted with degrees demonstrate better job performance than those who do not. **1 2 3 4 5 6**

JOB SATISFACTION

38. Having or pursuing an advanced degree has increased my job satisfaction. **1 2 3 4 5 6**

39. Officers having or pursuing advanced degrees have higher job satisfaction those who do not. **1 2 3 4 5 6**

40. Enlisted having or pursuing degrees have higher job satisfaction than those who do not. **1 2 3 4 5 6**

VALUE

41. Having or pursuing an advanced degree is valuable to me. **1 2 3 4 5 6**

42. Having or pursuing an advanced degree has increased my level of confidence. **1 2 3 4 5 6**

43. My having/pursuing an advanced degree is valuable to the military. **1 2 3 4 5 6**

44. Officers having/pursuing advanced degrees are valuable to the military. **1 2 3 4 5 6**

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Not Applicable
1	**2**	**3**	**4**	**5**	**6**

45. Enlisted having/pursuing degrees are valuable to the military.	**1**	**2**	**3**	**4**	**5**	**6**
46. Having/pursuing an advanced degree has helped me clearly express my ideas in writing.	**1**	**2**	**3**	**4**	**5**	**6**
47. Having/pursuing an advanced degree has helped me clearly express my ideas in briefings.	**1**	**2**	**3**	**4**	**5**	**6**
48. Having/pursuing an advanced degree has helped me think critically.	**1**	**2**	**3**	**4**	**5**	**6**
49. Having/pursuing an advanced degree has increased my comprehension of managerial/leadership techniques.	**1**	**2**	**3**	**4**	**5**	**6**

Thank you for your participation!

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Vitae

Tony Alley

Lieutenant Colonel (Ret.) Alley received his commission in the United States Air Force through the AFROTC program at the University of Cincinnati in 1975. He has served as a Reconnaissance Pilot in the RF-4C Phantom II and as an Instructor Pilot in the T-37. He also served with HQ ATC, managing curriculum development for pilot training programs and as the Chief of Curriculum Development for ACSC's Nonresident Programs. He is a graduate of SOS, the Royal Air Force Staff College, and holds a Masters Degree in Education from the University of Oklahoma. Prior to his retirement, he served as the Associate Dean of Education and Curriculum with ACSC.

Edward L. Bolton, Jr.

Major (Lieutenant Colonel select) Bolton is a 1983 graduate of Officers Training School. He received a Bachelor of Science degree in Electrical Engineering from the University of New Mexico through the Airmen Education and Commissioning Program. Since his commissioning, Major Bolton has completed three tours in the acquisition career field. At Norton AFT, he was program manager for the Peacekeeper missile guidance system. At Andrews AFB, he worked successively as an assignments officer and aircraft requirements manager in Headquarters Air Force Systems Command. Most recently, Major Bolton was assigned as chief engineer for the Titan Centaur satellite booster program at Los Angeles AFB. Major Bolton received a Master of Science degree in Systems Management from the University of Southern California in 1986. After

graduation, he will be assigned to Headquarters Air Force Space Command as Chief, Launch Vehicle Systems Branch.

Benjamin F. Findley, Jr.

Colonel Ben Findley, US Air Force Reserve, is assigned as Assistant to the Provost of Air University. He received his commission through the West Virginia ROTC program in 1969. He served on active duty until 1972. His Air Force Reserve assignments have included duty as chief of procurement at Sheppard Air Force Base, personnel staff officer at Bergstrom AFB, Reese AFB, and Special Operations Command, Atlantic at Fort Bragg, North Carolina. As a civilian, Dr. Findley is Director of Human Resources Management for the five campuses of Pensacola Junior College. He earned his doctorate degree in business and teaching from the School of Business at the University of Northern Colorado in 1982.

William S. Mosley

Major Mosley earned his commission with the United States Air Force through Officer Training School in 1981. After completing navigator training he served tours as a KC-135 navigator/instructor navigator at Castle AFB and as an instructor/evaluator at Specialized Undergraduate Navigator Training, Mather AFB. His most recent assignment was at Squadron Officer School where he worked as flight commander, curriculum manager, and executive officer. Major Mosley earned a Bachelor of Science in Business Administration from the University of Missouri, a Master of Business Administration from Golden Gate University, and is ABD for a Doctor of Public Administration from the University of Alabama. After Air Command and Staff College, he will be reassigned to USEUCOM working as a staff officer in J3.

Lawrence Mwambola

Lieutenant Colonel Mwambola received his commission in the Tanzania Air Force in November 1976 after graduating as a transport pilot instructor in Canada. Since that time he has served as a pilot instructor for the transport pilot trainees in the Tanzania Air Force.

Jeffrey N. Renehan

Major (Lieutenant Colonel select) Renehan received his commission in the United States Air Force through the Reserve Officers Training Corps in 1981 and completed a Masters in Business Administration through the AFIT Minuteman Education Program in 1986. After an initial tour as an ICBM operations crew member, he was selected for the Strategic Air Command's ICBM operational test launch program. Two years later, he was assigned to the Secretary of the Air Force's ICBM Modernization acquisition office in the Pentagon where he served as a program element monitor and congressional liaison officer. In 1992, he was selected for a joint duty assignment at the Department of State in Washington DC as the Space and Missile Policy Advisor to the Assistant Secretary of State for Political Military Affairs. Major Renehan has completed Squadron Officer School in residence and by correspondence; and after completing Air Command and Staff College, he will be attending the School of Advanced Airpower Studies at Maxwell AFB.

Glenward L. Spivey

Dr. Spivey is Educational Advisor to the Commandant, Air Command and Staff College (ACSC). He served as an instructor at Enterprise State Junior College from 1972 to 1974. From 1974 to 1981 Dr. Spivey was employed as a Research Associate with the Alabama State Department of Education. He served as an Education Specialist at the Air

Force Academic Instructor School from 1982-1984. He joined the ACSC staff in October 1984. Dr. Spivey received his BS, MEd, and EdD degrees from Auburn University and a Master's degree in Counseling from Troy State University. He is a colonel in the Air Force Reserve and is the IMA to the Air University Director of Plans and Operations.

John F. Thompson

Major Thompson received his commission from the United States Air Force Academy in 1984. He served his initial tour as a behavioral scientist at Randolph AFB, Texas, then in 1987 was assigned as an Air Force Institute of Technology student at St. Mary's University in San Antonio. After completing his Master's Degree in Industrial Engineering, he served tours as a systems acquisition officer, holding a variety of staff jobs at Air Force Systems Command and Air Force Materiel Command headquarters and as a program manager for the Tri-Service Standoff Attack Missile System Program Office at Wright-Patterson AFB, Ohio. Major Thompson has completed Squadron Officer School in residence and by correspondence; and after completing Air Command and Staff College, he will be assigned as an Acquisition Policy Officer, SAF/AQPM, Pentagon.

Jack Weinstein

Major Weinstein received his commission in the United States Air Force as a distinguished graduate through the Reserve Officer Training Corps in 1982. After attending Minuteman III Combat Crew Training, he was assigned as a missile combat crew member with the 321st Strategic Missile Wing, Grand Forks Air Force Base, North Dakota and served as an Instructor, Evaluator, Flight Commander, and Emergency War Order Training Officer. He has been assigned to the 1st Strategic Aerospace Division, Headquarters Twentieth Air Force, Headquarters Air Combat Command, and

Headquarters Air Force Space Command in numerous intercontinental ballistic missile staff officer duties. Major Weinstein completed Squadron Officers School in residence and correspondence in 1987 and Air Command and Staff College by correspondence in 1994, he will be assigned to USSTRATCOM as an ICBM Requirements Officer.